TM 11-5810-256-10-1

# NET CONTROLLER OPERATING INSTRUCTIONS FOR COMMUNICATIONS SECURITY EQUIPMENT KY-57


HOW TO USE THIS MANUAL
Page iii

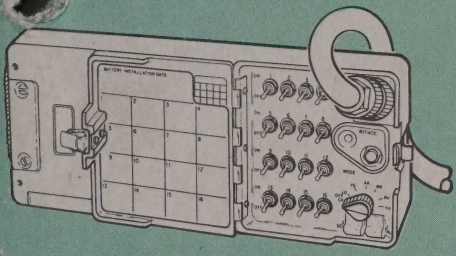
EQUIPMENT DESCRIPTION & CONFIGURATIONS
Page 1-2

CONTROLS AND INDICATORS
Page 2-1

OPERATING PROCEDURE INDEX
Page 2-10

REPLACING BATTERIES
Page 3-2

INDEX
Page Index 1


Headquarters, Department of the Army
Washington, DC, JUNE 1988


**FOR OFFICIAL USE ONLY**

**WARNING**

**Batteries used in the KY-57 can explode if they are mishandled or abused. Battery explosions can cause death or severe injury, equipment damage, and environmental contamination. Be sure you understand how to correctly handle, and dispose of, both mercury and lithium batteries.**

**WARNING**

## Lithium Batteries (BA-5590/U)

- DO NOT heat, incinerate, crush, puncture, disassemble, or mutilate the battery.
- DO NOT short circuit the battery or bypass the internal fuse.
- NEVER attempt to recharge the battery.
- TURN OFF THE EQUIPMENT if you:
  - feel the battery case getting overly hot.
  - hear a hissing sound coming from the battery case.
  - smell "rotten eggs" (sulpher dioxide gas).
- ALWAYS let the battery cool completely (30 to 60 minutes) after it has overheated before you attempt to remove it from your equipment, or to handle it.
- NEVER attempt to reuse a battery that has overheated or that appears to be damaged in any way.
- ALWAYS dispose of lithium batteries correctly - your unit SOP will tell you how.

## Mercury Batteries (BA-1372/U)

- NEVER incinerate mercury batteries.
- ALWAYS be careful not to short the batteries (accidentally or otherwise).
- ALWAYS dispose of mercury batteries correctly - your unit SOP will tell you how.

TECHNICAL MANUAL
No. 11-5810-256-10-1

*TM 11-5810-256-10-1
Headquarters
Department of the Army
Washington, DC *30 June 1988*

# NET CONTROLLER OPERATING INSTRUCTIONS for COMMUNICATIONS SECURITY EQUIPMENT KY-57 (NSN 5810-00-434-3644)

**REPORTING OF ERRORS**

**You can improve this manual by recommending improvements using DA Form 2028 (Recommended changes to Publications and Blank Forms). Mail the form directly to: Commander, U.S. Army Communications Security Logistics Activity, ATTN: SELCL-NMP-TP, Fort Huachuca, AZ 85613. A reply will be provided directly to you.**

The technical or operational information in this manual is required solely for official use, therefore, distribution is authorized to U.S. Government agencies only. This determination was made on 22 January 1987. Requests from outside the U.S. Government for release of this publication under the Foreign Military Sales Program must be made to Commander, U.S. Army Security Assistance Center, ATTN: AMSAC-MI/I, 5001 Eisenhower Ave., Alexandria, VA 22333-0001. Requests from outside the U.S. Government for release of this publication under the Freedom of Information Act must be made to Director, National Security Agency, ATTN: SO5, Fort George G. Meade, MD 20755-6000.

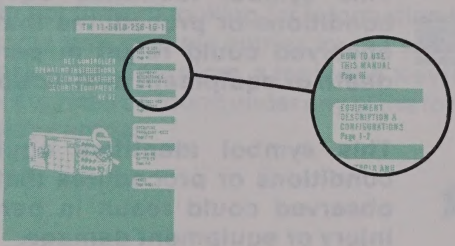
## DESTRUCTION NOTICE

Destroy by any method that will prevent disclosure of contents or reconstruction of the document.

*This manual supersedes TM 11-5810-256-OP-1, 15 January 1984, including all changes.

This manual is intended to provide a quick, convenient reference for Net Controllers operating the KY-57 in a communications network. It is not intended to replace other publications on the KY-57, or to provide detailed procedures for all Net Controller operations. It will, however, provide a ready reference to commonly performed Net Controller tasks. To assist you in identifying these tasks, and locating them within this TM, the following methods have been used.

- **Front Cover Index** - this index is located along the right side of the front cover and lists the most common functions you, the Net Controller, perform. Each index entry contains the name of the particular section or procedure and the page number where it is found.



- **Procedure Index** - each procedure index lists all the operating procedures contained in a chapter or section together with the individual page numbers on which each procedure begins.

- **Notes, Cautions, Warnings** - notes, cautions, and warnings are used to highlight information that you, the Net Controller, should know to prevent injury to yourself or others, damage to your equipment, or identify special information that you should pay particular attention to. In addition to notes, cautions, and warnings, this manual uses three other attention flags. These are **Important**, **Remember**, and **Look for this**. All these flags are illustrated and defined below:

**This symbol identifies equipment conditions or procedures that if not observed could result in personnel death or equipment destruction.**

**This symbol identifies equipment conditions or procedures that if not observed could result in personnel injury or equipment damage.**

**This symbol identifies information of general operational importance.**

IMPORTANT

**This symbol identifies information that the operator should observe to ensure that his system is operating "SECURE".**

REMEMBER ?!

**This symbol identifies information that you should remember.**

LOOK FOR THIS

**This symbol identifies equipment conditions, displays, or indications that you should watch for while performing a procedure.**

- **Alphabetical Index** - The alphabetical index (located at the back of this book) lists major headings from the contents. Since all of us do not think of looking for information the same way, multiple entries for the same topic may exist. Therefore, a topic like **Keying the KY-57** may be found under any of the following Index entries:

**Loading**
KY-57

**Keying**
KY-57 Key

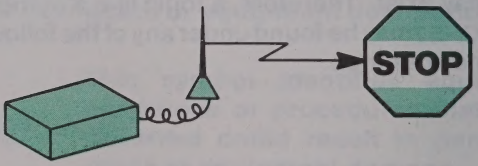
**KOI-18**
Keying

**KY-57**
Using to load KY-57 key

**Start-up**
Loading KY-57 key

By going to any of the listed entries, you will find the correct page number for your desired procedure. You can now go to that page and start your procedure.

**Where to Stop** a procedure. Since space in this manual is limited, some procedures will start on the same page that another procedure ends. To help prevent you from going beyond the end of one procedure and into the next one, the end of each procedure is marked with the following symbol:



# CHAPTER 1
# INTRODUCTION

## SECTION I GENERAL INFORMATION

### 1-1. SCOPE

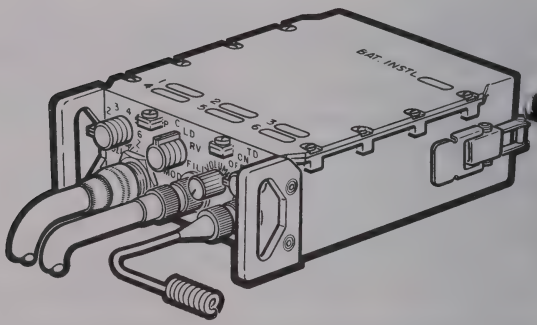
TYPE OF MANUAL

This manual is a pocket-size supplemental operator's manual for the KY-57 communications security equipment. It is the first volume of seven pocket-size manuals, that together with TM 11-5810-256-12 (Operator's and Unit Maintenance Manual for the KY-57), provide operating procedures needed to start-up, key, operate, and power-down your KY-57. Remember; however, that this manual is not intended to replace other KY-57 publications. Neither does it provide detailed operating procedures nor does it cover all operations you may be required to perform. It does provide a quick, convenient reference for operating the KY-57 in a communications network.

This volume specifically addresses use of the KYX-15/15A Net Control Device.

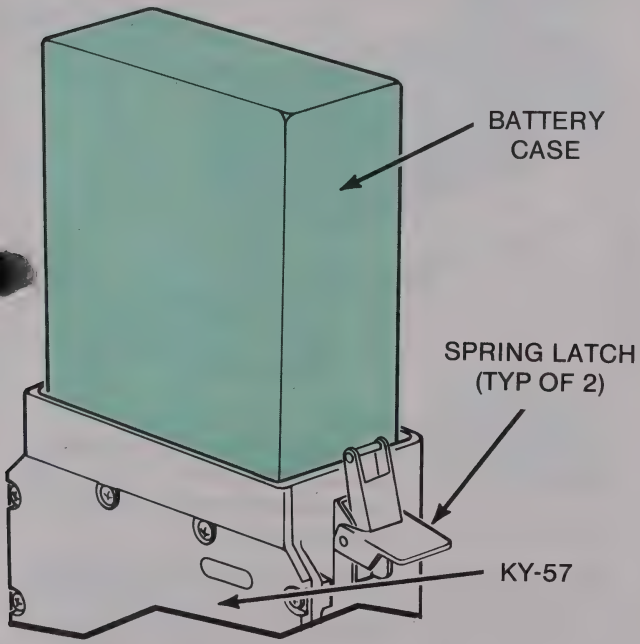
## EQUIPMENT DESCRIPTION AND CONFIGURATIONS

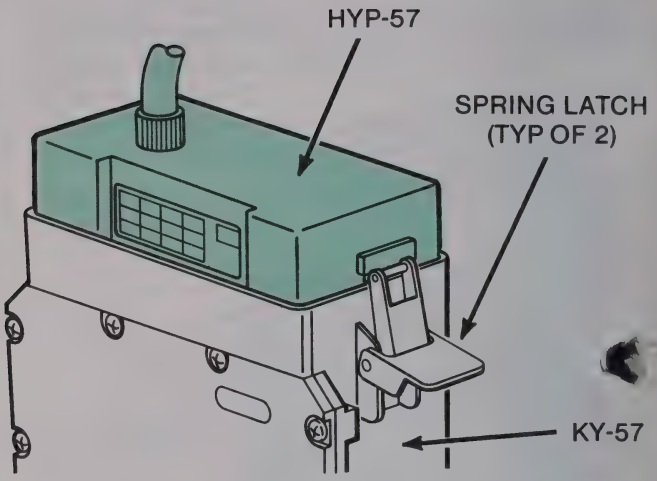
The KY-57 communications security equipment is a lightweight, direct current (dc) powered **Cryptographic Controlled Item (CCI).** It is used to provide secured voice inputs to tactical radio systems (AM/FM/SSB) or wireline systems.




The power required to operate the KY-57 is provided by either the HYP-57 Vehicular Power Adapter or a single BA-5590/U lithium battery.

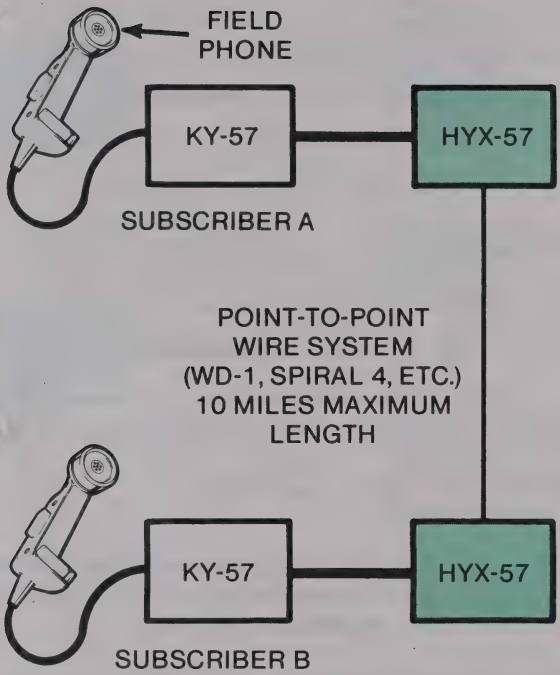
The BA-5590 is housed in and protected by a lightweight, metal battery case (Z-AIJ) when the KY-57 is configured for manpack or portable use. Both power sources are connected at the rear of the KY-57 and secured using two spring latches.



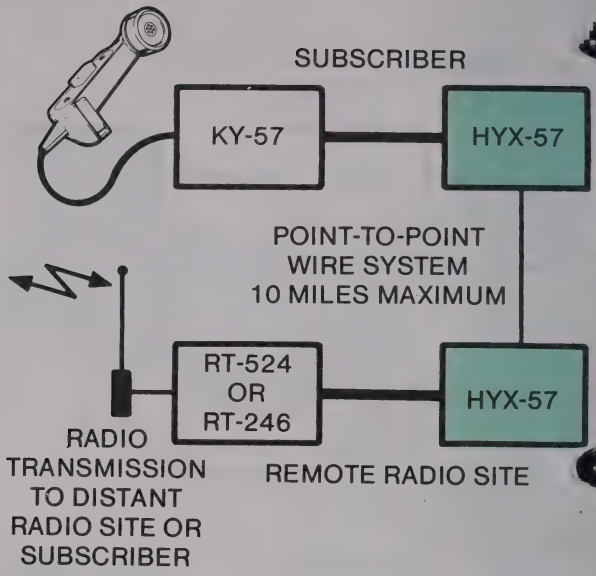



The HYX-57 Wireline Adapter is a dc powered interface device that allows the KY-57 to be used to secure single channel wireline systems. Examples of such systems are:

- Point-to-point Systems - Systems using field phone wire (WD-1) or similar use cable to run between two subscribers and exclusively for their use.

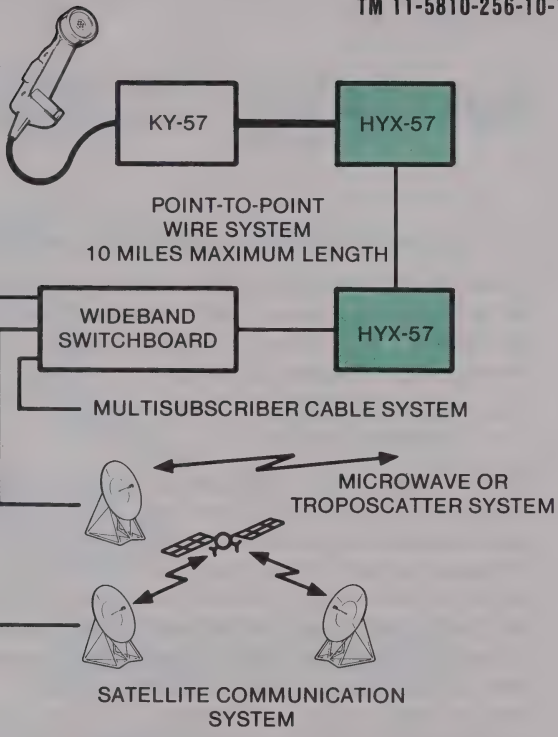



- Remote Radio Site Systems - Systems using field phone wire or dedicated cable to connect a subscriber to a physically separated field radio (example: RT-524 or RT-246.)




REMEMBER ?!?! **Both Subscribers must have KY-57's and be operating with the same key for secure operations.**

- Subscriber to Switchboard Systems - Systems allow subscriber to connect through wirelines/ cable to wideband switchboards for access to multichannel communications systems (cable, microwave, troposcatter, etc.)




REMEMBER ?!?!

**When operating through a switchboard, set your call up in plaintext. Once you are in communications with your distant party, coordinate securing the line.**

**See TM 11-5810-256-10-6 and TM 11-5810-256-10-7 for operation and use of the HYX-57.**

## 1-2. MAINTENANCE FORMS AND RECORDS

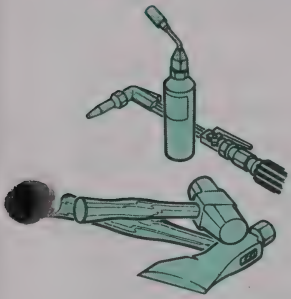
Department of the Army (DA) forms and records used for this equipment will be those directed by DA PAM 738-750 (The Army Maintenance Management System (TAMMS)).

## 1-3. DESTRUCTION TO PREVENT ENEMY USE

Destruction of the KY-57 (and its related devices) to prevent further use of the equipment, will be accomplished in accordance with the COMSEC emergency plan for your unit. If time does not permit implementation of the emergency plan, destruction will be accomplished upon the orders of the senior person present. Selection of adequate destruction materials for the KY-57 is the responsibility of the commander and should be based on a comprehensive assessment of the tactical conditions. The following are approved, effective methods for emergency destruction of the KY-57 (for details, see chapter 1 of TM 11-5810-256-12):

- Incendiary Hand Grenade TH3 (AN/M-14)

**For OCONUS use only.**



- Incinerators
- Acetylene and propane torches, sledge hammers, fire axes, gunfire, etc.

## ACTION SUBSEQUENT TO LOSS OR DESTRUCTION

See AR 380-40 for actions required when the KY-57 is destroyed.

## 1-4. ADMINISTRATIVE STORAGE

COMSEC/CCI material is stored in accordance with TB 380-41.

## SECTION II EQUIPMENT DESCRIPTION

### 1-5. EQUIPMENT CHARACTERISTICS

The KY-57 is a man portable/vehicular mounted device used to provide secure radio transmission/reception in a tactical environment. (For details, see chapter 1 of TM 11-5810-256-12).

# CHAPTER 2
# OPERATING INSTRUCTIONS

## SECTION I DESCRIPTION AND USE OF OPERATOR'S CONTROLS AND INDICATORS

### 2-1. GENERAL

This manual provides key loading and transfer procedures for the KY-57 when it is used with the KYX-15/15A Net Control Device. It also provides general procedures for establishing secure radio operation. It does not attempt to cover all Net Control procedures or radio operating procedures. For detailed procedures on establishing and operating cryptonets, see TB 380-40-2. Detailed operating procedures for your specific radio are provided in the TM 11 series manuals for your radio; while further guidance for generating, distributing, and superseding cryptonet keys is provided in KAG-46( ) TSEC.

NOTE

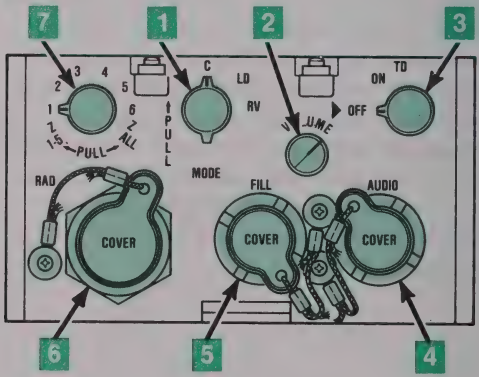
KAG-46 ( )/TSEC is stored in your COMSEC account and is available for reference through your COMSEC custodian.

IMPORTANT

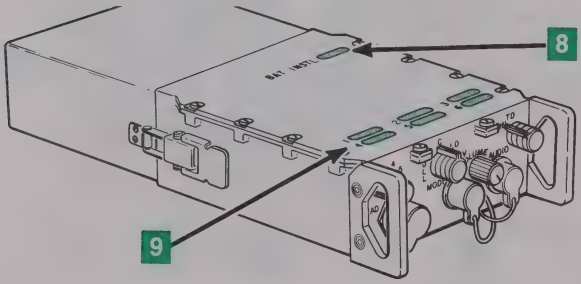
Under most conditions, you will not be allowed to remove KAG-46( ) from the COMSEC account. Prepare yourself by taking some time to read and review this manual before you go into the field - it could save you time and trouble later.

## 2-2. CONTROLS AND INDICATORS

- KY-57



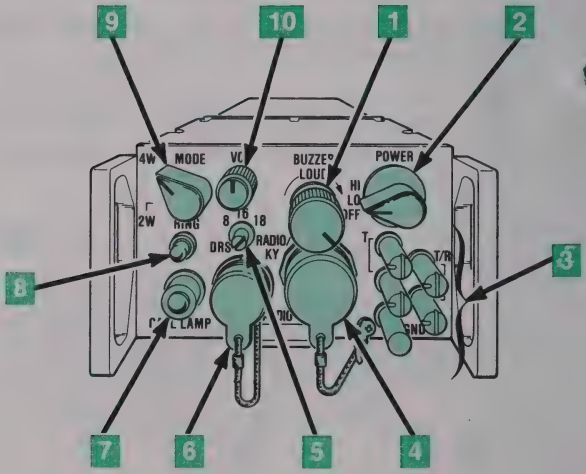
1. MODE switch - 4-position switch used to select KY-57 operating mode.
2. VOLUME control - Rotary control used to adjust received audio level.
3. POWER/TIME DELAY switch - 3-position switch used to control power to the KY-57.
4. AUDIO connector - 6-pin connector used to connect handset to KY-57.
5. FILL connector - 6-pin connector used to connect Common Fill cable or Common Fill Device to KY-57.
6. RAD connector - 19-pin connector used to connect KY-57 to the radio.
7. FILL switch - 8-position switch used to select the KY-57 register you are loading a key into. Also used when zeroizing the KY-57.



8 BAT INSTL - writing surface used to record date fill battery was last changed.

9 Key record - writing surfaces (1 through 6) used to record key designator for keys loaded in KY-57 registers 1 through 6.

- **HYX-57**



1 BUZZER control - rotary control adjusts the volume of the buzzer used to signal incoming traffic.

2 POWER Switch - 3-position switch used to select power output to wireline from the HYX-57, and to remove power from the HYX-57.

REMEMBER ?!?! **Set the POWER switch to LO if your distance from your repeater is between 0 and 4 miles. Set the switch to HI if you are from 4 to 10 miles away from your repeater.**

CAUTION **DO NOT use HI power in remote FM configurations.**

3 Binding Posts - used to connect wire circuit (WD-1, etc.) to HYX-57. Three sets of posts are available. These are:

- T/R - 2 posts used to establish a 2-wire or 4-wire circuit.
- T - 2 posts used to establish a 4-wire circuit.
- GND - Single post used to ground the HYX-57.

4 RADIO/KY - 26-pin connector used to connect the HYX-57 to the radio, or to another HYX-57.

5 DRS (Data Rate Switch) - 3-position switch used to select the HYX-57 operating speed (data rate) 8 and 16 VINSON, 18 NESTOR.

6 AUDIO connector - 6-pin connector used to connect handset to the HYX-57.

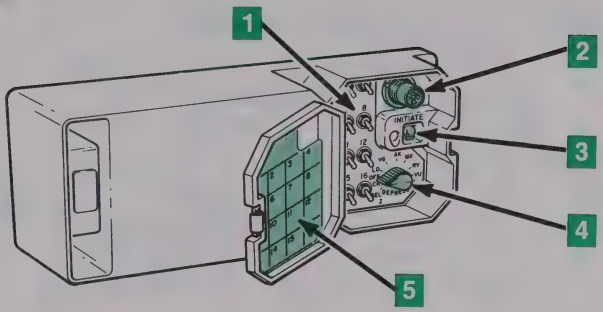
7 CALL LAMP - lights when incoming call is received.

8 RING - pushbutton switch used to ring distant end of HYX-57 wireline system.

9 MODE switch - 2-position switch used to select HYX-57 2-wire or 4-wire operation.

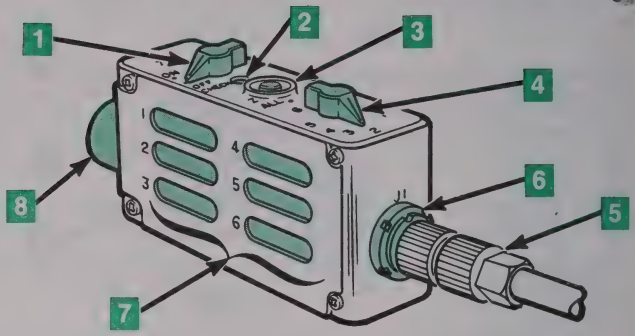
10 VOL control - rotary control used to adjust received audio volume.

- KYX-15/15A




1. ADDRESS SELECT switches - sixteen 2-position toggle switches used to select the register you are loading to or from.
2. Fill connector - 6-pin connector connects common fill cable to KYX-15.
3. INITIATE switch - pushbutton switch initiates operation/action selected by MODE switch. Initiate lamp lights to indicate action is completed.
4. MODE switch - 9-position switch used to select KYX-15 operating mode.
5. Writing surface - used for temporary record keeping.

- KYK-13




1. MODE switch - 3-position switch used to select KYK-13 operating mode.
2. Parity light - light flashes when parity is checked, or when load is transferred.
3. INITIATE switch - pushbutton switch pressed to start load transfer or zeroize action.
4. ADDRESS SELECT switch - 7-position switch used to select the storage register to which a key will be loaded. Also configures KYK-13 to allow zeroizing loaded registers.
5. Common Fill cable - for reference only.

6 J1 - 6-pin connector used to connect KYK-13, through a common fill cable, to a COMSEC/CCI device, or to another common fill device.

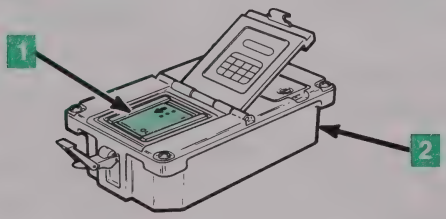
7 Key record - writing surfaces (1 through 6) used to record key designators for keys loaded in registers 1 through 6.

8 P1 - 6-pin connector used to connect KYK-13 directly to a COMSEC/CCI device, or to another common fill device.

CAUTION

**P1 should be used only in emergency conditions (i.e., fill cable is damaged - no spare available) as damage to both KYK-13 and the COMSEC item can occur during direct connection.**

- KOI-18



1 Tape Reader - electromechanically decodes punched paper tapes (i.e., key tapes). Tapes are manually inserted into the IN slot, aligned, and pulled through the reader (from the OUT slot).

2 J1 - 6-pin connector connects the KOI-18 directly to a KYK-13, or through a fill cable to the KYX-15, other fill devices, or COMSEC/CCI devices.

## SECTION II OPERATION

### 2-3. OPERATING PROCEDURE INDEX

This index identifies operating procedures by name, by paragraph number, and by page. It should help you find the specific procedure you are looking for.


| PROCEDURE TITLE | PARAGRAPH NUMBER | PAGE NUMBER |
|---|---|---|
| Operation under unusual conditions | 2-4 | 2-13 |
| Operation under usual conditions | 2-5 | 2-13 |
| General | 2-6 | 2-14 |

| PROCEDURE TITLE | PARAGRAPH NUMBER | PAGE NUMBER |
|---|---|---|
| Loading the KY-57 from the KOI-18 | 2-7 | 2-16 |
| Loading the KY-57 from the KYK-13 | 2-8 | 2-20 |
| Loading the KY-57 from the KYX-15 | 2-9 | 2-24 |
| Loading the KYX-15 from the KOI-18 | 2-10 | 2-28 |
| Loading the KYX-15 from the KYK-13 | 2-11 | 2-32 |
| Loading the KYK-13 from the KOI-18 | 2-12 | 2-35 |
| Loading the KYK-13 from the KYX-15 | 2-13 | 2-39 |
| Loading the KYK-13 from the KYK-13 | 2-14 | 2-44 |
| Typical radio system operating procedures | 2-15 | 3-47 |
| Operating the KY-57 with the KYX-57 | 2-16 | 2-56 |
| Operating without a repeater | 2-17 | 2-56 |

| PROCEDURE TITLE | PARAGRAPH NUMBER | PAGE NUMBER |
|---|---|---|
| Operating with a repeater | 2-18 | 2-61 |
| Zeroizing the KY-57 | 2-19 | 2-66 |
| Zeroizing the KY-57 Registers 1 through 5 | 2-20 | 2-67 |
| Zeroizing KY-57 Register 6 | 2-21 | 2-68 |
| Zeroizing KY-57 CVN and RKV | 2-22 | 2-69 |
| Zeroizing all KYK-13 Registers | 2-23 | 2-70 |
| Zeroizing KYX-15 Single or Multiple Registers | 2-24 | 2-72 |
| Zeroizing all KYX-15 Registers | 2-25 | 2-73 |
| Key Generate Procedure | 2-26 | 2-75 |
| Automatic Remote Keying (AK) Procedure | 2-27 | 2-79 |
| Manual Remote Keying (ME) Procedure | 2-28 | 2-85 |

## 2-4. OPERATION UNDER UNUSUAL CONDITIONS

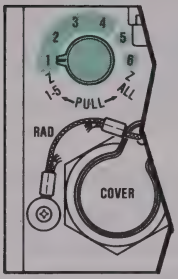
You may be operating your equipment in rain, snow, tropical or desert heat, or blowing dust. Make sure you keep your equipment as clean and dry as possible, take extra care in handling batteries, and regularly perform your PMCS (see TM 11-5810-256-12, Chapter 4). Other than observing these general guidelines, operation under unusual conditions is the same as your routine operation.

## 2-5. OPERATION UNDER USUAL CONDITIONS

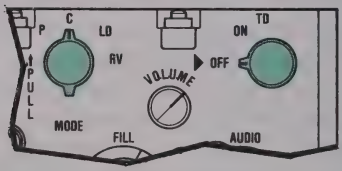
Operation of the KY-57 in a cryptonet is based on the communications requirements of that net, and will vary from net to net. At times, it will vary even within a single net, depending on the tactical communications situation. This manual cannot provide detailed operating procedures for all the possible situations that you, the Net Controller, will encounter. Instead, this manual provides a group of procedures that provide key loading, transfer, and zeroizing instructions. It is up to you - the Net Controller -, based on your knowledge and experience, to determine what procedure you need - and when you need it.

## 2-6. GENERAL

The following general instructions apply any time you operate the KY-57.




- Use KY-57 registers 1 through 4 to store cryptonet keys (CNV).
- When using the KYX-15 with the KY-57, use register 5 for temporary storage.
- Use register 6 to store the rekeying key (RKV).

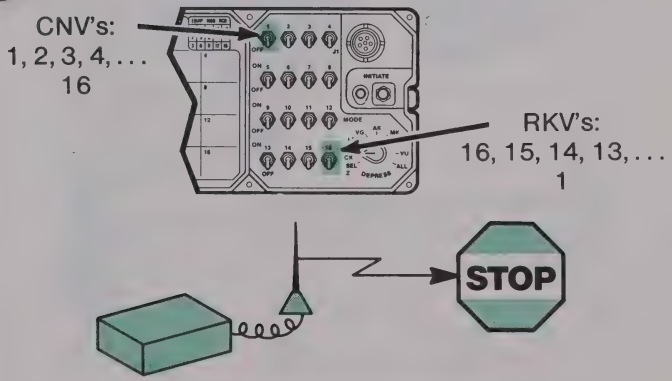



- **ALWAYS** use the MODE switch to change from securetext (C) to plaintext (P). **NEVER** disable the KY-57 (by setting the power switch to OFF) to obtain plaintext operation.

IMPORTANT

**You may remember that you turned the KY-57 off, but the next guy may not. If he doesn't remember, or notice the power switch setting, there's a real chance that classified information can be transmitted in plaintext. So play it safe, do it "by the book".**

- When you are loading CNV's into the KYX-15, start with register 1 (switch 1) and work forward through the registers (1, 2, 3, 4, . . . 16). When loading RKV's, start with register 16 and work backward (16, 15, 14, . . . 1).

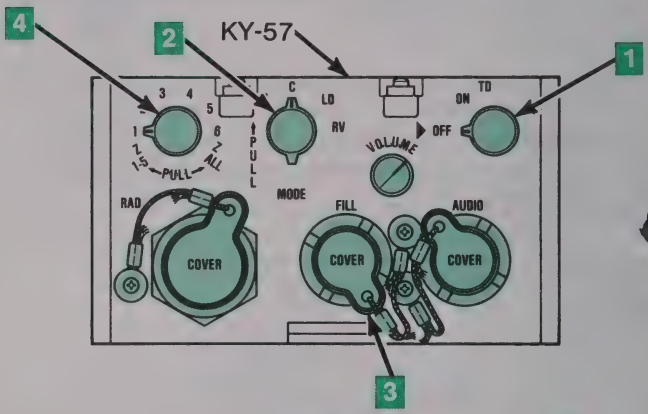


## 2-7. LOADING THE KY-57 FROM THE KOI-18

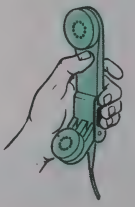
1. Set KY-57 POWER switch **1** to ON.
2. Set MODE **2** to C (ciphertext).

LOOK FOR THIS

**Alarms (rushing noise with beeps) should be heard in handset.**




3. Press and release handset push-to-talk (PTT) switch to clear alarms.
4. Using fill cable, connect KOI-18 J1 to KY-57 Fill connector **3** .



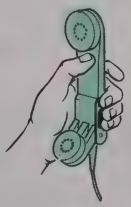
5. Set FILL switch 4 to position to be filled.
   - Listen for tone in handset.

LOOK FOR THIS

**A constant tone in the handset shows that the register is empty.**

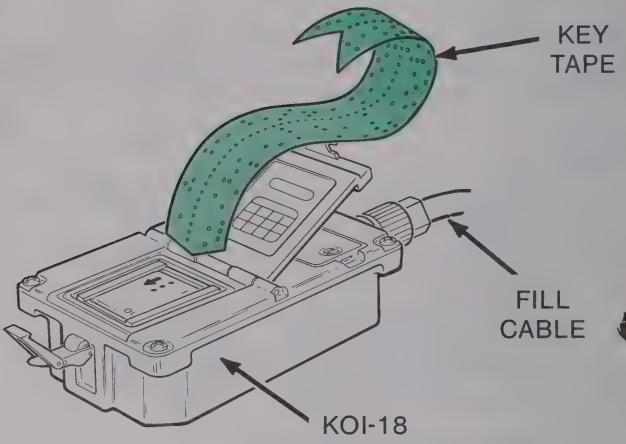
A beep shows that there is already a key in the register you selected.
*If you want to keep the key, set the Fill switch to another position.
*If you want to replace the key, continue with this procedure; the existing key in the register will be replaced during loading operations.

6. Insert Tape leader into KOI-18 IN slot. Line up tape feed holes with white dots on KOI-18.



7. Press and release handset PTT.

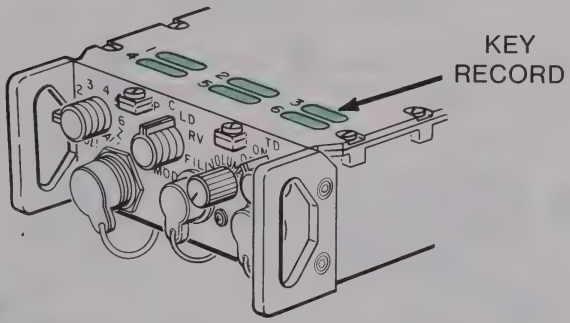
8. Pull tape through the KOI-18 at a moderate rate.



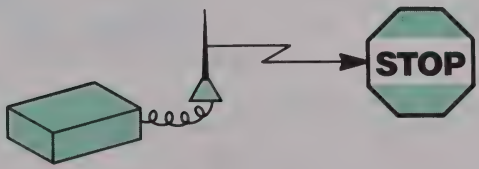

LOOK FOR THIS

**A beep should be heard in the handset after the tape is pulled through the KOI-18 (this indicates good parity). If you don't hear the beep, set KY-57 Power to off, then repeat this procedure. If beep still doesn't sound, call for maintenance.**

9. Record key designator on KY-57 key record writing surface.



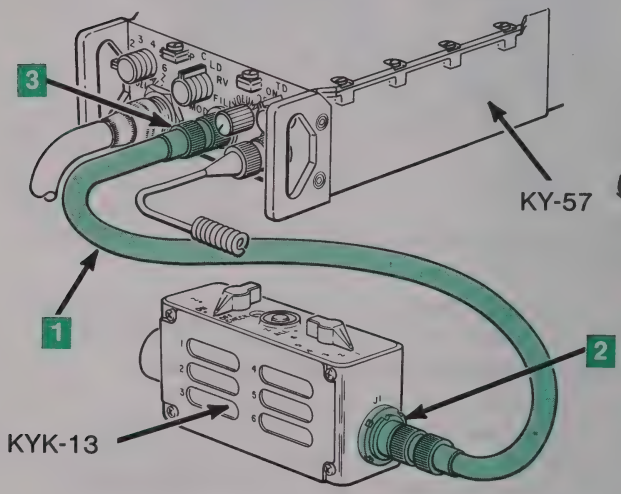

10. Repeat steps 3 through 9 for each key to be loaded.
11. After last key is loaded, disconnect fill cable from KY-57. Store cable and KOI-18 as directed by local SOP/directives.



## 2-8. LOADING THE KY-57 FROM THE KYK-13

**REMEMBER ?!?!** **When connecting the KYK-13 to the KY-57, the KYK-13 MODE switch should be set to OFF/CHECK.**

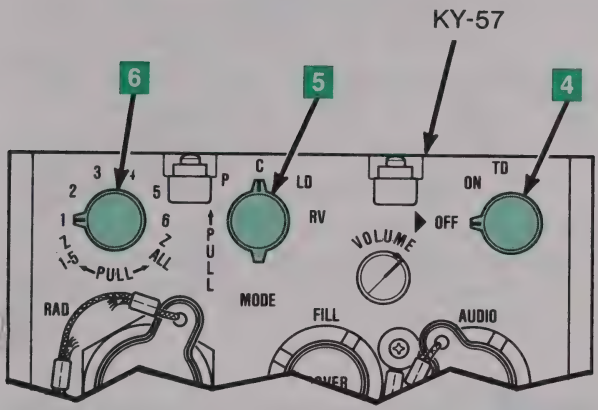
1. Using Fill cable **1**, connect KYK-13 J-1 **2** to KY-57 FILL connector **3**.

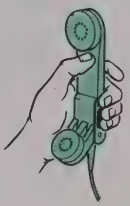



2. Set KY-57 POWER switch **4** to ON.
3. Set KY-57 MODE **5** to C.

LOOK FOR THIS

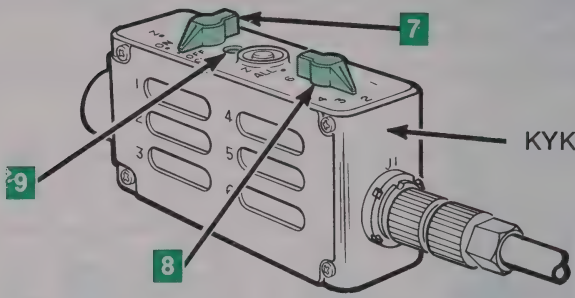
**Alarms (rushing noise with beeps) should be heard in handset.**



4. Press and release handset PTT switch to clear alarms.
5. Set KY-57 MODE **5** to LD.
6. Set KY-57 FILL switch **6** to position to be filled.

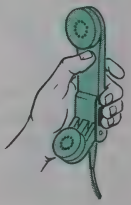
7. Set KYK-13 MODE switch **7** to ON.




8. Set KYK-13 FILL switch **8** to position (1 through 6) of register containing key to be transferred.

CAUTION **Do not press KYK-13 Initiate Switch.**

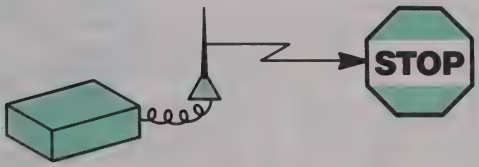
9. Press and release handset PTT.



IMPORTANT **When you press the PTT, one beep will be heard; when you release it, a second beep is heard.**

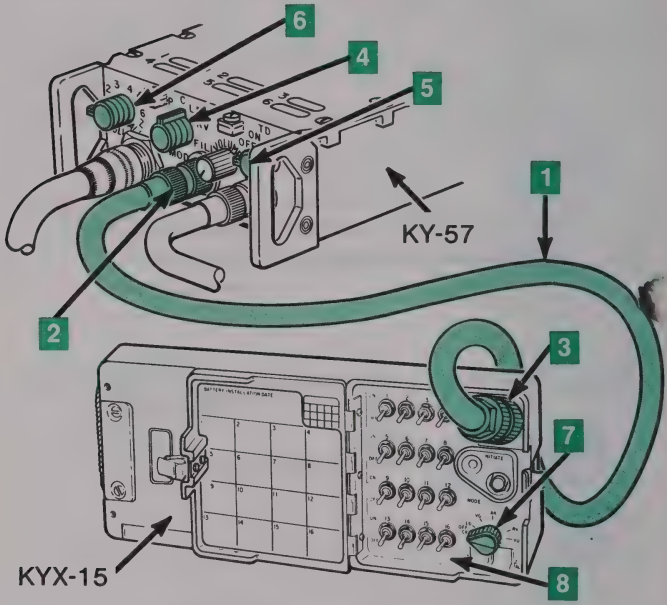
**When you release the PTT, the KYK-13 Parity light 9 should blink.**

10. Record key designator on KY-57 key record writing surface.
11. Repeat steps 3 through 10 for each key to be loaded.
12. Set KYK-13 MODE switch to OFF/CHECK.
13. Set KY-57 POWER to OFF.
14. After last key is loaded, disconnect fill cable from KY-57. Store cable and KYK-13 as directed by local SOP/directives.



## 2-9. LOADING THE KY-57 FROM THE KYX-15

1. Using fill cable **1**, connect KY-57 FILL connector **2** to KYX-15 Input/Output connector **3**.

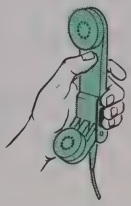



2. Set KY-57 MODE **4** to C.
3. Set KY-57 POWER **5** to ON.

LOOK FOR THIS

**Alarms (rushing noise with beeps) should be heard in handset.**

4. Press and release handset PTT to clear alarms.
5. Set KY-57 MODE **4** to LD.



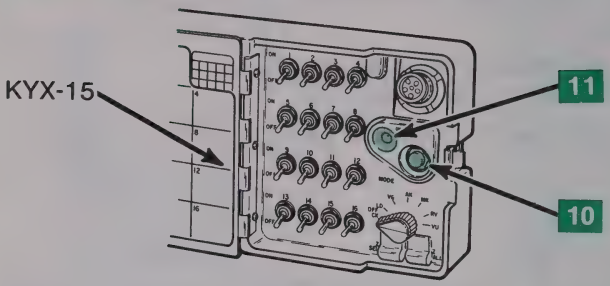
REMEMBER ?!

**When MODE is set to LD, a continuous tone heard in the handset means that the selected register is empty; a beep means a key is stored in the register.**

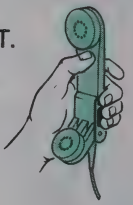
6. Set KY-57 FILL switch **6** to position to be filled.
7. Set KYX-15 MODE switch **7** to LD.
8. Set KYX-15 ADDRESS SELECT switch (1 through 16) **8** for register containing key to be transferred to ON.

CAUTION

**Do not press KYX-15 INITIATE switch 10.**




9. Press and release handset PTT.



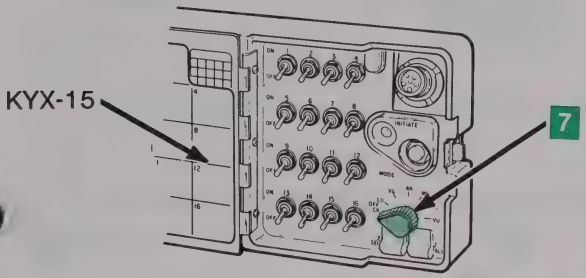
IMPORTANT

**When you press the PTT, one beep will be heard; when you release it, a second beep is heard.**

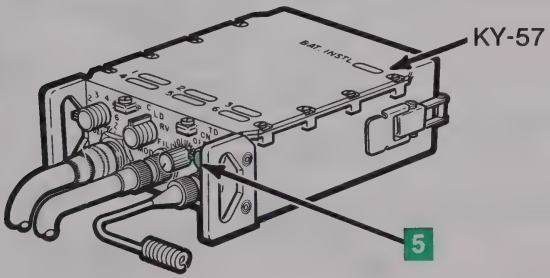
LOOK FOR THIS

**When you release the PTT, the KYX-15 INITIATE light 11 should blink.**

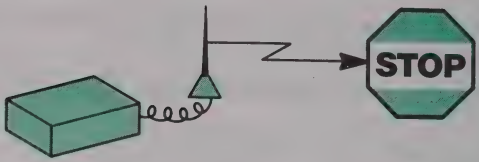
10. Record Key Designator on KY-57 key record writing surface.
11. Set KYX-15 ADDRESS SELECT switch to OFF.
12. Repeat Steps 6 through 11 for each key to be loaded.
13. Set KYX-15 MODE switch **7** to OFF/CK.




14. Set KY-57 POWER switch **5** to OFF.

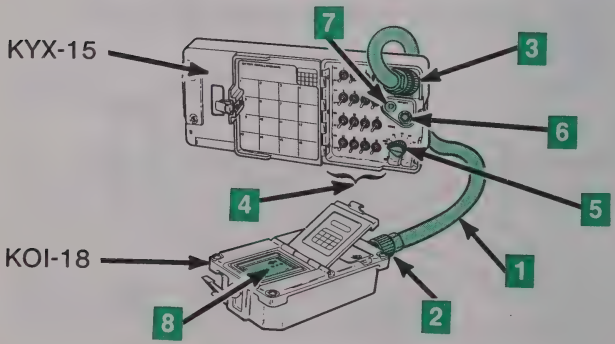


15. After last key is loaded, disconnect fill cable from KY-57. Store cable and KYX-15 as directed by local SOP/directives.




## 2-10. LOADING THE KYX-15 FROM THE KOI-18

1. Using Fill cable **1** , connect KOI-18 J1 **2** to KYX-15 Input/Output connector **3** .



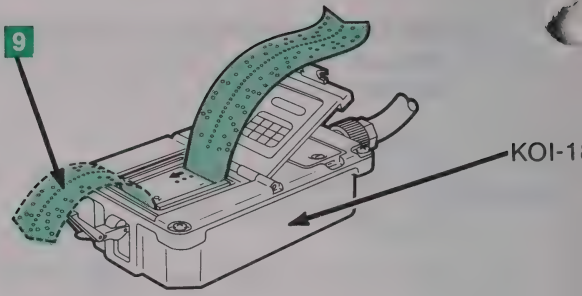
2. Set KYX-15 ADDRESS SELECT switch (1 through 16) 4 for register to be filled to ON.

REMEMBER ?!?! **Set all other ADDRESS SELECT switches to OFF.**

3. Set KYX-15 MODE switch 5 to ZSEL.
4. Press and release KYX-15 INITIATE switch 6 .
5. Set KYX-15 MODE to OFF/CK.
6. Press and release KYX-15 INITIATE switch.

LOOK FOR THIS **KYX-15 INITIATE light 7 should not flash. If light does flash, call maintenance.**

7. Set KYX-15 MODE switch to LD.
8. Insert key tape leader into KOI-18 IN slot 8.
   - Line up tape feed holes with white dots on KOI-18
9. Press and release KYX-15 INITIATE switch 6 .

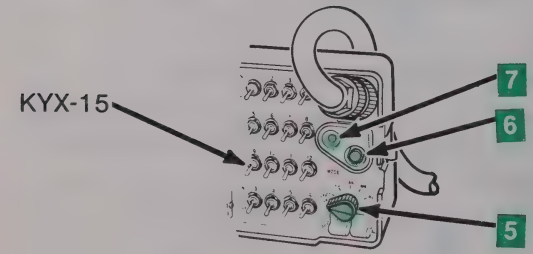



10. Pull Key tape **9** through KOI-18 at a moderate rate.

LOOK FOR THIS

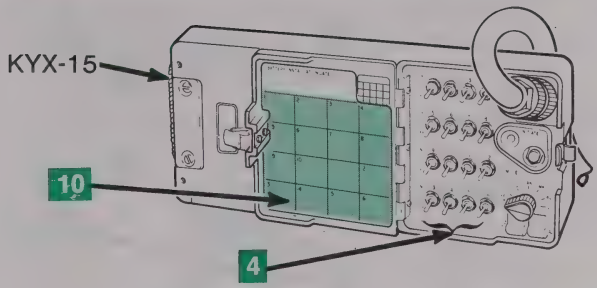
**KYX-15 INITIATE light 7 should flash.**

11. Set KYX-15 MODE switch **5** to OFF/CK.
12. Press and release KYX-15 INITIATE switch **6**.

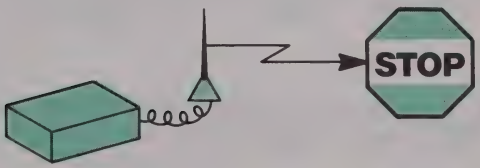


LOOK FOR THIS

**INITIATE light 7 should flash.**

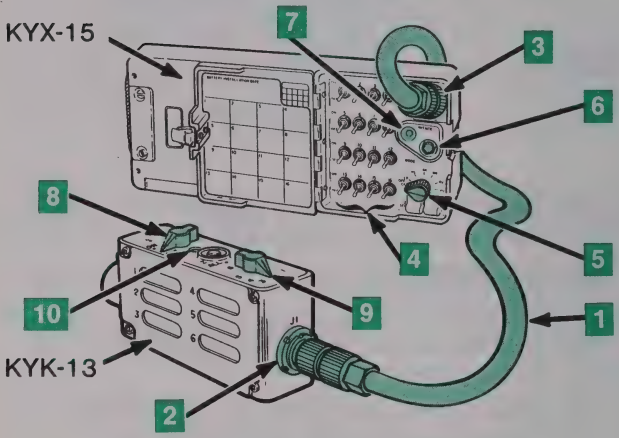



13. Record Key Designator on KYX-15 key record writing surface **10** .
14. Set ADDRESS SELECT switch **4** (for key just loaded) to OFF.
15. Repeat steps 2 through 14 for each key to be loaded.
16. After last key is loaded, disconnect fill cable from KYX-15. Store cable and KOI-18 as directed by local SOP/directives.



## 2-11. LOADING THE KYX-15 FROM THE KYK-13

1. Using Fill cable **1**, connect KYK-13 **2** to KYX-15 Input/Output connector **3**.




2. Set KYX-15 ADDRESS SELECT switch (1 through 16) **4** for register to be filled to ON.

**REMEMBER ?!** **Set all other ADDRESS SELECT switches to OFF.**

3. Set KYX-15 MODE switch 5 to ZSEL.
4. Press and release KYX-15 INITIATE switch 6 .
5. Set KYX-15 MODE to OFF/CK.
6. Press and release KYX-15 INITIATE switch.

LOOK FOR THIS

**KYX-15 INITIATE light 7 should not flash. If light does flash, call maintenance.**

7. Set KYX-15 MODE to LD.
8. Set KYK-13 MODE switch 8 to ON.
9. Set KYK-13 FILL switch 9 to position (1 through 6) of register containing key to be transferred.

CAUTION

**Do not press KYK-13 INITIATE switch.**

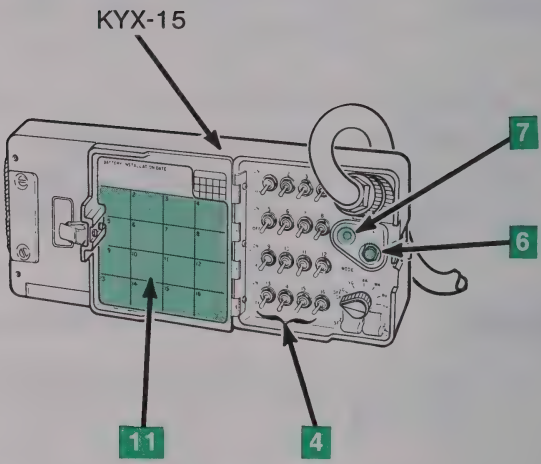
10. Press and release the KYX-15 INITIATE switch 6 .

LOOK FOR THIS

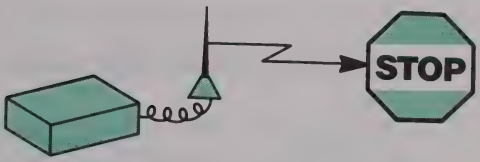
**Both the KYX-15 INITIATE light 7 and the KYK-13 Parity light 10 should flash.**

11. Set KYX-15 MODE switch **5** to OFF/CK.
12. Set KYK-13 MODE switch **8** to OFF/CHECK.
13. Press and release KYX-15 INITIATE switch **6** .

**LOOK FOR THIS** **KYX-15 INITIATE light 7 should flash.**

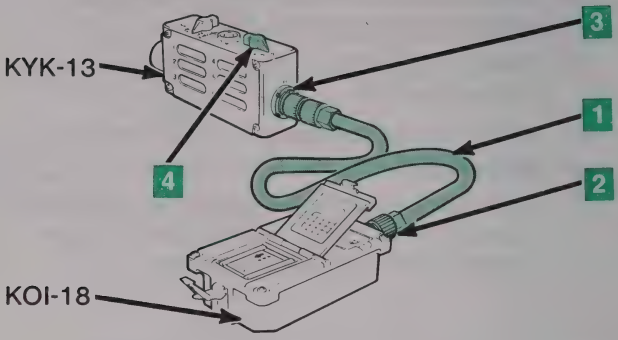


14. Record Key Designator on KYX-15 key record writing surface 11 .
15. Set ADDRESS SELECT switch 4 (for key just loaded) to OFF.
16. Repeat steps 2 through 15 for each key to be loaded.
17. After last key is loaded, disconnect fill cable from KYX-15. Store cable and KYK-13 as directed by local SOP/directives.

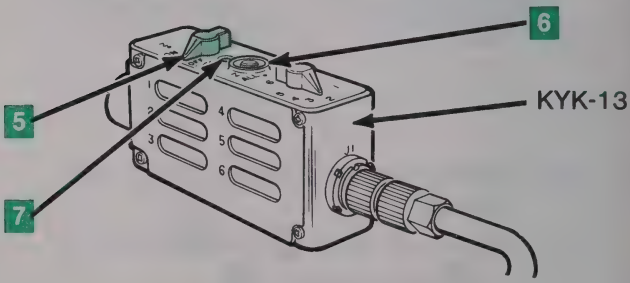



## 2-12. LOADING THE KYK-13 FROM THE KOI-18

1. Using a fill cable 1 , connect KOI-18 J1 2 to KYK-13 J1 3 .




2. Set KYK-13 FILL switch 4 to register to b loaded.



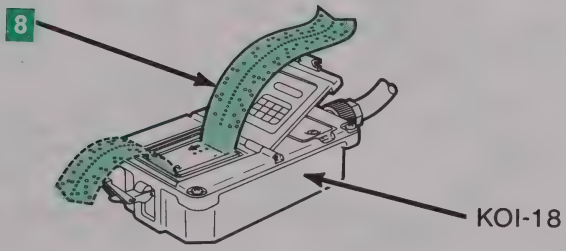

3. Set KYK-13 MODE switch 5 to Z. Hold it in this position.

4. Press and release KYK-13 INITIATE switch **6** .
5. Set KYK-13 MODE switch to OFF/CHECK.
6. Press and release KYK-13 INITIATE switch.

LOOK FOR THIS

**KYK-13 Parity light 7 should not flash. If light flashes, call maintenance.**

7. Set KYK-13 MODE switch to ON.
8. Insert key tape leader into KOI-18 IN slot.
   - Line up tape feed holes with white dots on KOI-18.
9. Press and release KYK-13 INITIATE switch **6** .



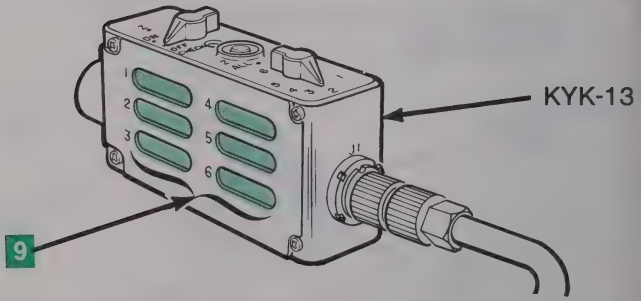
10. Pull tape **8** through KOI-18 at a moderate rate.

LOOK FOR THIS — **KYK-13 Parity light 7 should flash.**

11. Set KYK-13 MODE switch **5** to OFF/CHECK.
12. Press and release KYK-13 INITIATE switch **6** .

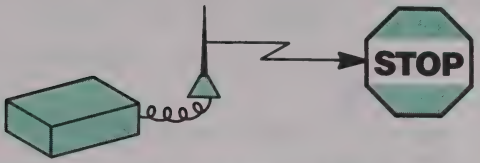
LOOK FOR THIS — **KYK-13 Parity light 7 should flash.**

13. Record Key Designator on KYK-13 key record writing surface **9** .



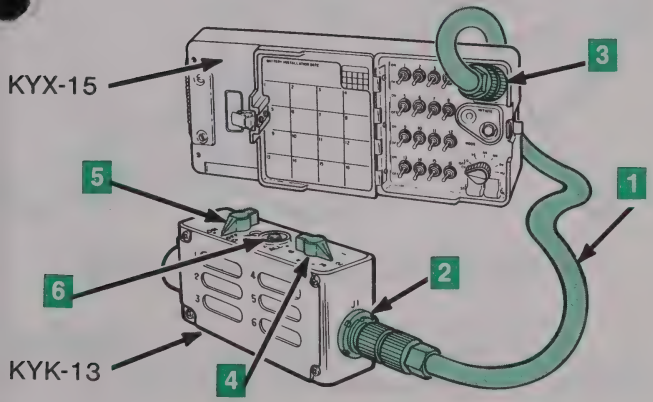

14. Repeat steps 2 through 13 for each key to be loaded.

15. After last key is loaded, disconnect fill cable from KYK-13. Store cable and KOI-18 as directed by local SOP/directives.

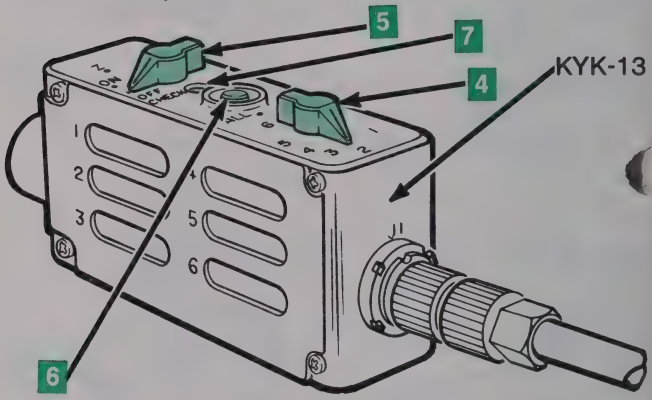



## 2-13. LOADING THE KYK-13 FROM THE KYX-15

1. Using a fill cable **1** , connect KYK-13 J1 **2** to KYX-15 Input/Output connector **3** .



2. Set KYK-13 FILL switch 4 to register to be loaded.
3. Set KYK-13 MODE switch 5 to Z. Hold it in this position.
4. Press and release KYK-13 INITIATE switch 6 .
5. Set KYK-13 MODE switch 5 to OFF/CHECK.



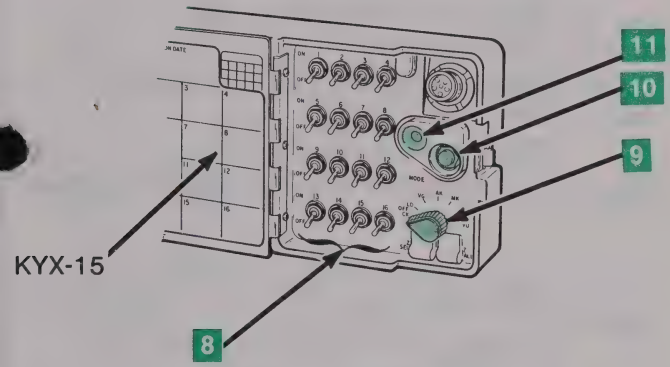

6. Press and release INITIATE switch 6 .

LOOK FOR THIS

**Parity light 7 should not flash. If light flashes, call maintenance.**

7. Set KYK-13 MODE switch **5** to ON.
8. Set KYX-15 ADDRESS SELECT switch (1 through 16) **8** for register containing key to be transferred to ON.

REMEMBER?!? **Set all other Address Select switches to OFF.**




9. Set KYX-15 MODE switch **9** to LD.

CAUTION **Do not press KYX-15 INITIATE switch 10 .**

10. Press and release KYK-13 INITIATE switch **6** .

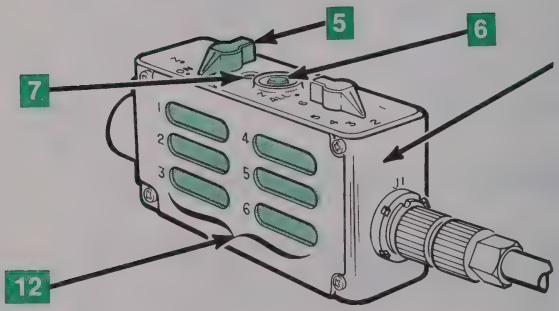
LOOK FOR THIS

**Both KYK-13 Parity light 7 and KYX-15 INITIATE light 11 should flash.**

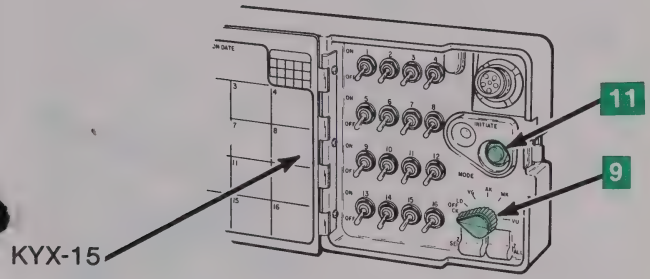
11. Set KYX-15 ADDRESS SELECT switch **8** (for key just transferred) to OFF.
12. Set KYK-13 MODE switch **5** to OFF/CHECK.
13. Press and release KYK-13 INITIATE switch **6** .

LOOK FOR THIS

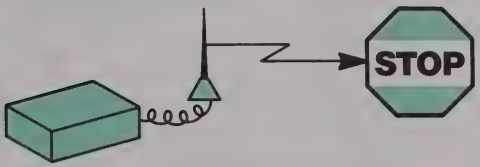
**KYK-13 Parity light 7 should flash.**



14. Record Key Designator on KYK-13 key record writing surface **12** .
15. Repeat steps 2 through 14 for each key to be loaded.
16. Set KYX-15 MODE switch **9** to OFF/CK.

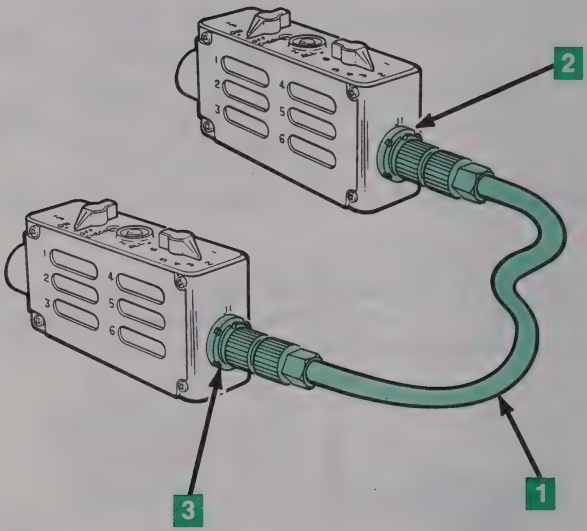



17. After last key is loaded, disconnect fill cable from KYK-13. Store cable and KYX-15 as directed by local SOP/directives.

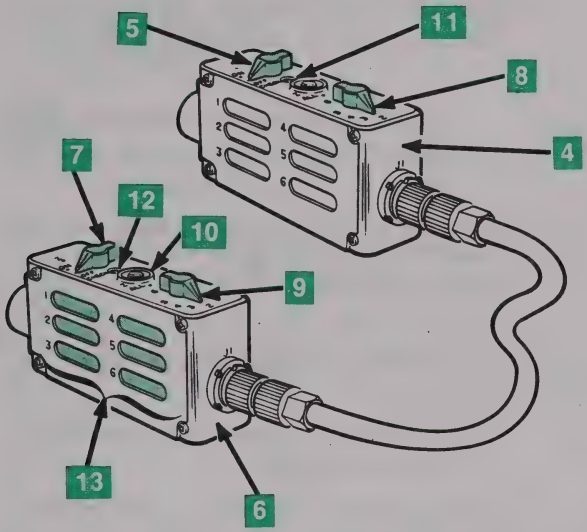


## 2-14. LOADING THE KYK-13 FROM THE KYK-13

1. Using fill cable **1**, connect J1 **2** of KYK-13 containing key to J1 **3** of KYK-13 to be loaded.



2. On KYK-13 containing Key 4 , set MODE switch 5 to ON.




3. On KYK-13 receiving key (being loaded) 6 , Set MODE switch 7 to ON.
4. On KYK-13 containing Key 4 , set FILL switch 8 to position (1 through 6) of register containing desired key.

5. On KYK-13 being loaded **6**, set Fill switch **9** to position (1 through 6) of register to be loaded.
6. On KYK-13 being loaded **6**, press and release INITIATE switch **10**.

LOOK FOR THIS

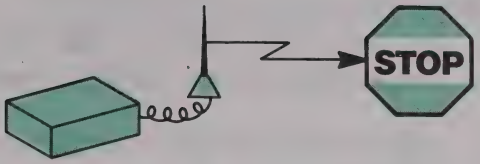
**Parity lights on both KYK-13s (11 and 12) should flash.**

7. On the KYK-13 being loaded **6**:
   - Set MODE switch **7** to OFF/CHECK.
   - Press and release INITIATE switch **10**.

LOOK FOR THIS

**Parity light 12 should flash.**

   - Record Key Designator on key record writing surface **13**.
8. Repeat steps 3 through 7 for each key to be loaded.
9. On KYK-13 containing key **4**, set MODE switch **5** to OFF/CHECK.
10. After last key is loaded, disconnect fill cable from both KYK-13's. Store cable and KYK-13's as directed by local SOP/directives.

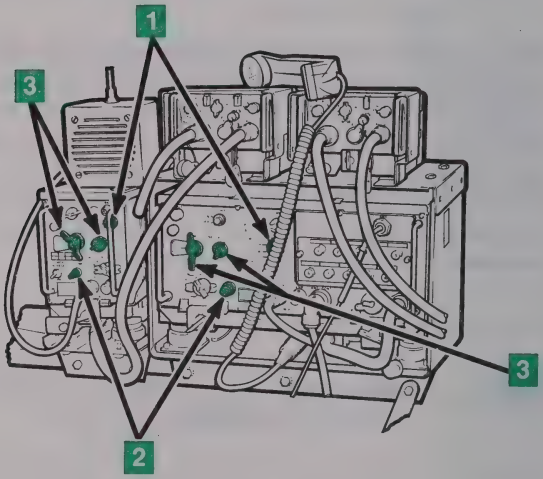



## 2-15. TYPICAL RADIO SYSTEM OPERATING PROCEDURES

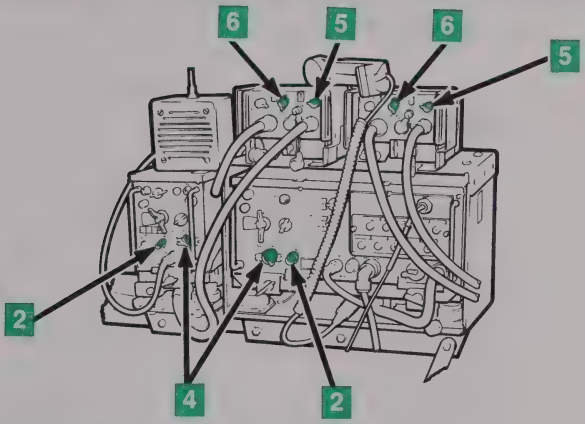
This paragraph provides general radio operating procedures for AM/FM/SSB radios used with the KY-57. It is intended to familiarize you with the steps required to achieve plaintext and securetext operation in a radio system equipped with the KY-57. For specific operation of your radio equipment, refer to the TM 11-series technical manuals for your radio.

**The radio equipment shown in this paragraph is a typical vehicular/ shelter installation.**

- Plaintext (Clear Voice) Radio Operation
  1. Set radio POWER switch(es) **1** to ON.
  2. Adjust VOLUME control(s) **2** to desired level.
  3. Adjust FREQUENCY controls **3** to required frequency.



4. If squelching is required, set squelch controls **4** to ON.
5. Set KY-57 POWER **5** to ON.




IMPORTANT

**Always use the KY-57 MODE switch 6 to change from securetext (C) to plaintext (P). Never disable the KY-57 (by setting the Power Switch 5 to OFF) to obtain plaintext operation. If power to the KY-57 is OFF, transmission will be plaintext, regardless of the MODE switch setting. Play it Safe, do it "by the book."**

6. Set KY-57 MODE switch **6** to P.

REMEMBER ?!

**Pull out on the MODE switch knob before trying to rotate it to the P position.**

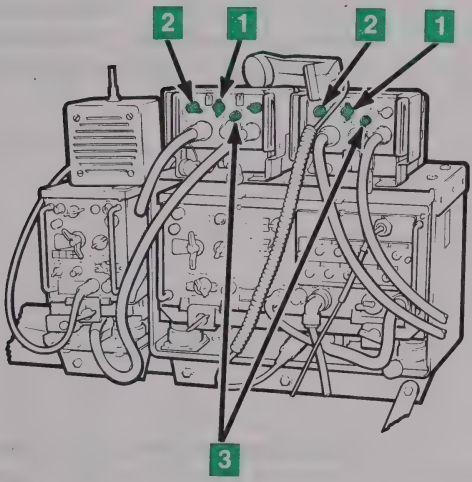
7. Establish radio communications:
   - to transmit:
     - Press handset PTT switch.
     - Listen for beep.
     - Speak with your lips close to the handset mouthpiece.
   - to receive:
     - Release PTT switch.
     - Adjust volume as necessary.

REMEMBER ?!

**In plaintext operation, use Radio Volume Control 2 to adjust receive audio signal.**

**If radio is installed using Junction Box J-3513, handset should remain connected to J-5 of Junction Box for all modes.**

- Switching from Plaintext (Clear Voice) to Securetext (Secure Voice) Operation.
  1. Identify Key for radio network you are entering.
  2. Identify KY-57 register (1 through 6) containing that key.




  3. Set KY-57 MODE switch **1** to C.
  4. Set KY-57 FILL switch **2** to the position (1 through 6) for the required key.

5. Establish radio communications:
   - to transmit:
     - Press handset PTT switch.
     - Listen for beep.

IMPORTANT

**If you don't hear a beep, YOUR SYSTEM IS NOT SECURE. Check your KY-57 loading procedures. If system will still not go secure, call maintenance.**

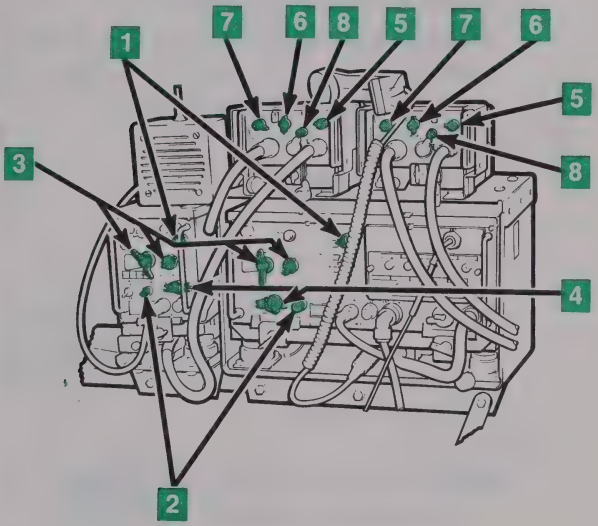
     - Speak with your lips close to the handset mouthpiece.

   - to receive:
     - Release PTT switch.
     - Adjust volume as necessary.

REMEMBER ?!?!

**In securetext operation, use KY-57 VOLUME CONTROL 3 to adjust receive audio signal.**

- Radio System Start-up in Securetext Operation
  1. Set radio POWER switch(es) **1** to ON.
  2. Adjust VOLUME control(s) **2** to desired level.
  3. Adjust FREQUENCY controls **3** to required frequency.



4. If squelching is required, set squelch controls **4** to ON.
5. Set KY-57 POWER **5** to ON.
6. Set KY-57 MODE switch **6** to C.
7. Set KY-57 FILL switch **7** to the position (1 through 6) for the register containing the proper key for the network you're entering.
8. Listen for alarms in handset.
9. Press and release handset PTT to clear alarms.
10. Establish radio communications:

- to transmit:
  - Press handset PTT switch.
  - Listen for beep.

IMPORTANT

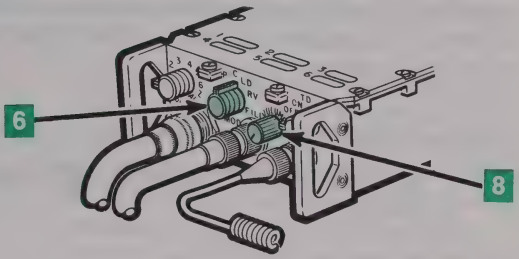
**If you don't hear a beep, YOUR SYSTEM IS NOT SECURE. Check your KY-57 loading procedures. If system will still not go secure, call maintenance.**

- Speak with your lips close to the handset mouthpiece.

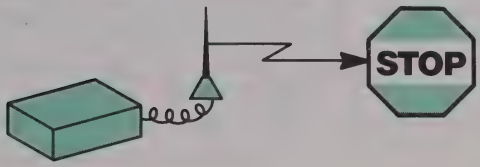
to receive:

- Release PTT switch.
- Adjust volume as necessary.

REMEMBER ?!?! **In securetext operation, use KY-57 VOLUME CONTROL 8 to adjust receive audio signal.**




11. To change from securetext to plaintext operation, pull out on KY-57 MODE switch knob 6 and set switch to P.

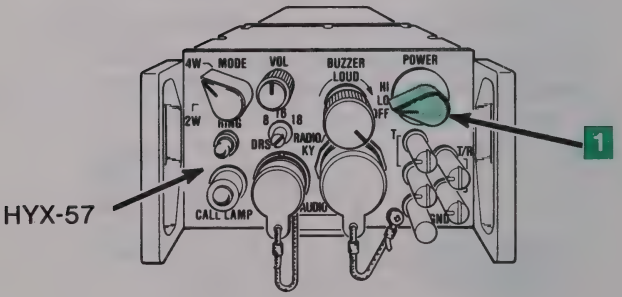


## 2-16. OPERATING THE KY-57 WITH THE HYX-57

The HYX-57 allows the KY-57 to interface to either point-to-point wireline systems or to wireline systems connecting the KY-57 site to a remote radio site. The wireline system may also include additional HYX-57s as repeaters to extend the normal maximum operating range of 10 miles. Detailed installation and operating procedures are provided in TM 11-5810-256-12, TM 11-5810-256-10-6, and TM 11-5810-256-10-7.

## 2-17. OPERATING WITHOUT A REPEATER

1. Set HYX-57 POWER switch 1 to proper range:



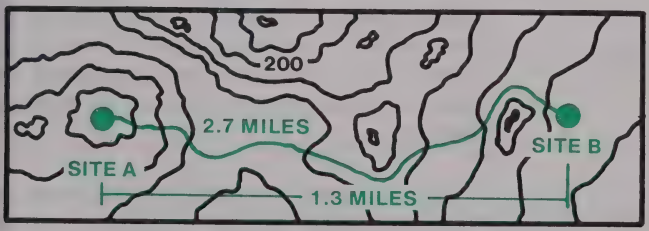
- **LO** if actual wireline distance is 4 miles or less.
- **HI** if actual wireline distance is 4 to 10 miles.

CAUTION

**The maximum allowable wireline distance between the HYX-57s used in a remote FM radio system is 4 miles. Always use the LO power setting in these systems.**

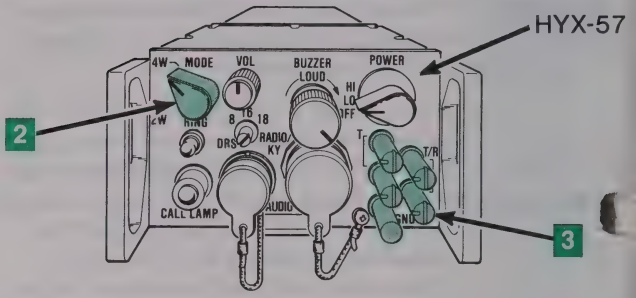
REMEMBER ?!

**The actual wireline distance is the measured length of the wire/cable, not the physical distance between sites. Because of terrain or tactical conditions, it is possible for the wireline distance and physical distance to differ by several miles.**




WIRELINE ROUTE

2. Set HYX-57 MODE switch **2** to 2W or 4W. This setting is determined by your circuit configuration, 2-wire (2W) or 4-wire (4W). Determine configuration by checking the number of wires attached to binding posts **3** .

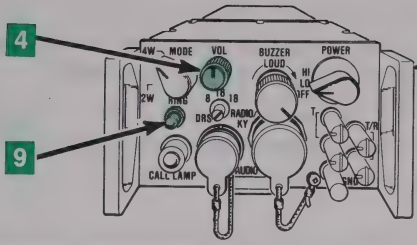



LOOK FOR THIS

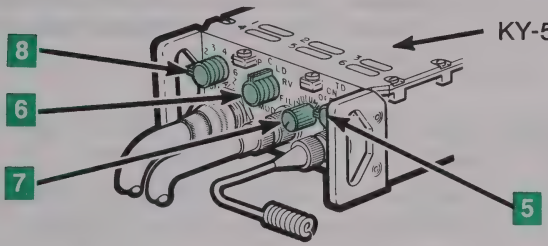
**If two wires are attached to the T/R posts only, you have a 2-wire circuit. If two wires are attached to the T/R posts and two wires are attached to the T posts, you have a 4-wire circuit.**

REMEMBER ?!

**The GND post should always have a wire attached going to an electrical ground.**




3. Set HYX-57 VOL control **4** to midrange position.
4. Set KY-57 POWER switch **5** to ON.



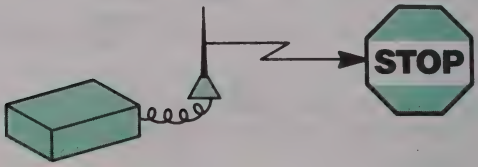

5. Set MODE switch **6** to C.
6. Set KY-57 VOLUME control **7** to midrange position.
7. Set FILL switch **8** to position (1 through 6) of register containing proper key for network.

LOOK FOR THIS **Alarms (rushing noise with beeps) should be heard in handset.**

8. Press and release handset PTT switch to clear alarms.

IMPORTANT **A constant tone in the handset means that your KY-57 is not keyed for secure operation. Reload the KY-57 key (see paragraphs 2-7 through 2-9), then try steps 1 through 8 of this procedure again. If constant tone is still heard, call maintenance.**

9. Press HYX-57 RING switch 9 for 1 to 2 seconds to ring distant subscriber.
10. When distant subscriber answers, establish communications using proper network procedures.

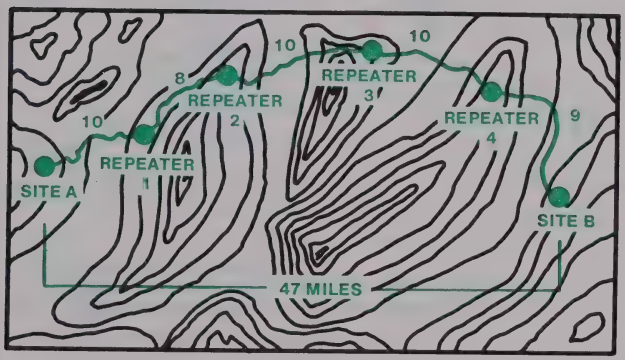


## 2-18. OPERATING WITH A REPEATER

**The KY-57 may be operated with single or multiple HYX-57 repeaters to provide the communications circuit length required.**

**Example:** The wireline distance between Site A and Site B is 47 miles. To provide this communications circuit, you will need four repeaters. (To find the number of repeaters, divide the total number of miles in the circuit (47) by the maximum allowed distance between HYX-57s (10). Round answer to next lower whole number (i.e., 47 ÷ 10 = 4.7 = 4)).

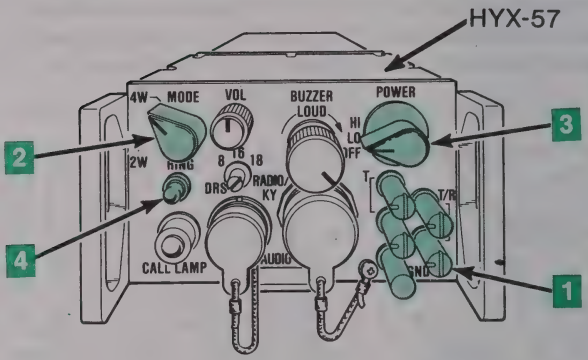
1. Determine distance between circuit links.



2. At each location, connect wire pair(s) to HYX-57 binding post **1** (T or T and T/R depending on the type of circuit, 2-wire or 4-wire, that you have).

REMEMBER ?!?!

**At the repeater site(s) you have two HYX-57s connected by an interconnecting cable (CX-13074). Make sure you make the proper connections to each HYX-57.**




- At the local terminals (Site A and Site B):
  1. Set HYX-57 MODE switch **2** to 2W or 4W as required for your circuit.

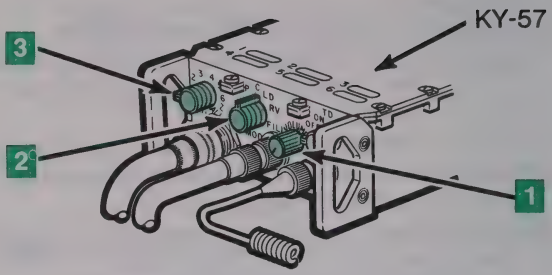
2. Set the POWER switch **3** to:
   - **LO** if actual wireline distance between terminal site and nearest repeater is 4 miles or less.
   - **HI** if actual wireline distance between terminal site and nearest repeater is 4 to 10 miles.
3. Press and release RING switch **4** .
4. When repeater site answers, establish communications and stand by.

- At the Repeater site(s):

1. Set HYX-57 MODE switch **2** to 2W or 4W as required.
2. Set POWER switch **3** to HI or LO as required.
3. Establish communications with next repeater or terminal site and stand by.

3. When plain voice communications have been established end-to-end (site A to Site B) through the repeater(s), then at the terminals:

- Set KY-57 VOLUME control **1** to approximately midrange.

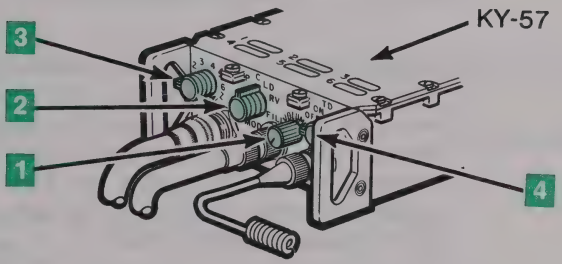



- Set KY-57 MODE switch **2** to P.
- Confirm end-to-end communications.
  - If necessary, press and release HYX-57 RING switch to contact nearest repeater.

NOTE

**Subscribers (Sites A and B) cannot ring through directly to each other. Instead, the subscriber must ring the nearest repeater, who rings the next repeater. This procedure continues until both subscribers and all repeater operators are on line, and communications are confirmed.**

- Set KY-57 MODE switch **2** to C.



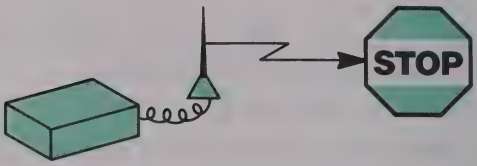

- Set FILL switch **3** to position (1 through 6) of register containing proper key.
- Set POWER switch **4** to TD.
- Press and hold handset PTT switch. A single beep heard in the handset indicates that system is secure.

IMPORTANT

**A constant tone in the handset means that your KY-57 is not keyed for secure operation. Reload the KY-57 Key (see paragraphs 2-7 through 2-9), then repeat steps 2 and 3 of this procedure. If constant tone is still heard, call maintenance.**

4. Conduct end-to-end communications using proper communications procedures.

REMEMBER ?!?! **Each time you want to establish end-to-end communications, you must start by ringing the nearest repeater and having all the repeaters, plus the distant terminal, come on line (in plaintext). you cannot ring directly from terminal to terminal.**



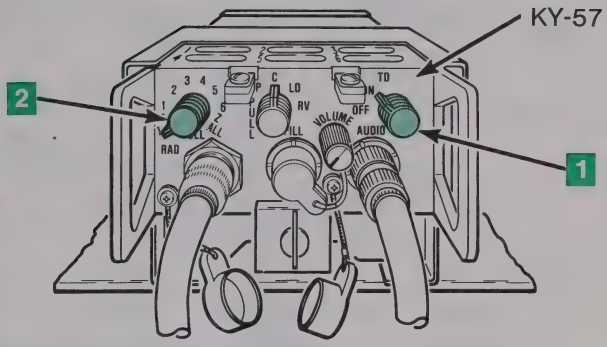

## 2-19. ZEROIZING THE KY-57

The KY-57 is zeroized to prevent operational keys from being captured, or when equipment is removed from service for maintenance evacuation or long term storage. Your Net Controller or your Commander will tell you when to zero your equipment.

## 2-20. ZEROIZING KY-57 REGISTERS 1 THROUGH 5

LOOK FOR THIS

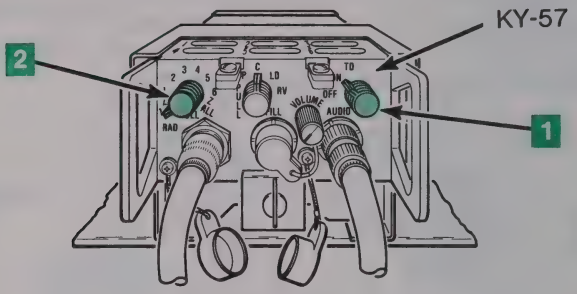
**If KY-57 POWER switch 1 is in the OFF position, set it to ON.**




1. Set FILL switch 2 to 1.
2. Pull out on FILL switch and turn counterclockwise to Z1-5.
3. Registers 1 through 5 are zeroed (emptied). Register 6 still contains key and can be used to provide secure communications. To zero register 6, see paragraph 2-21.

## 2-21. ZEROIZING KY-57 REGISTER 6

REMEMBER ?!? **KY-57 POWER switch 1 may be in the ON or OFF position to perform this procedure.**



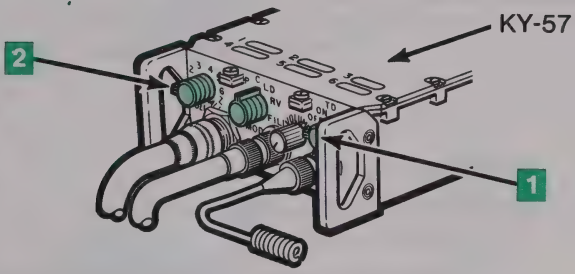

1. Set FILL switch 2 to 6.
2. Pull out on FILL switch and turn clockwise to Z ALL.
3. Register 6 is zeroed (emptied).

IMPORTANT **When all registers are zeroed, the KY-57 can be used for CLEAR VOICE (cleartext) operation ONLY.**

REMEMBER ?!? This procedure can also be used to zero all six KY-57 registers.

## 2-22. ZEROIZING KY-57 CVN AND RKV

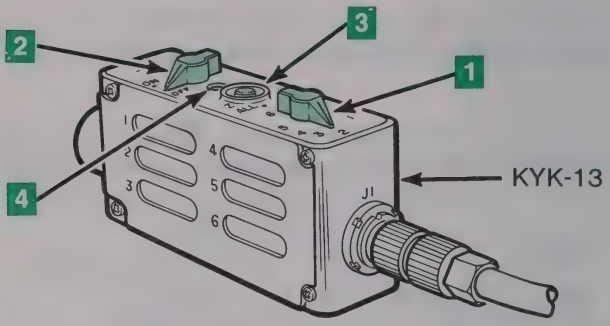
REMEMBER ?!? KY-57 POWER switch 1 may be in the ON or OFF position to perform this procedure.




- From any position, pull out on FILL switch 2 and rotate switch clockwise to Z ALL.

IMPORTANT KY-57 can now be used for CLEAR VOICE operation ONLY.

## 2-23. ZEROIZING ALL KYK-13 REGISTERS

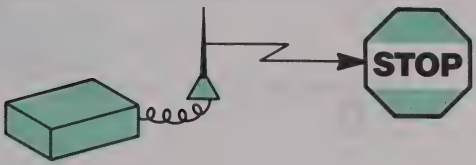



Zeroizing a single register:

1. Set FILL switch **1** to register (1 through 6) to be zeroed.
2. Set MODE switch **2** to Z and hold at Z.
3. Press and release INITIATE switch **3** .
4. Set MODE switch to OFF/CHECK.
5. Press and release INITIATE switch, Parity light **4** should remain OFF.
6. Repeat steps 1 through 5 for each key to be zeroed.

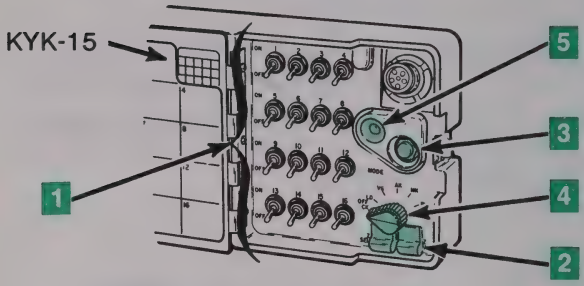
Zeroizing all registers

1. Set FILL switch **1** to Z ALL.
2. Set MODE switch **2** to Z and hold at Z.
3. Press and release INITIATE switch **3** .
4. Set MODE switch to OFF/CHECK.
5. Set FILL switch to 1.
6. Press and release INITIATE switch, Parity light **4** should remain OFF.
7. Repeat steps 5 and 6 for each register, resetting FILL switch to each position (2 through 6).



## 2-24. ZEROIZING KYX-15 SINGLE OR MULTIPLE REGISTERS

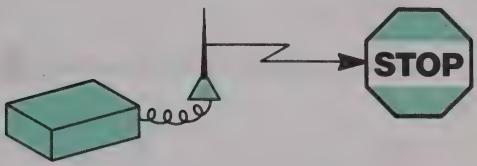
1. Set the KYX-15 ADDRESS SELECT switches **1** for the registers you need to zeroize to ON.




2. Press down on Z SEL protective plate **2** .

**This places the KYX-15 in the Zeroize mode.**

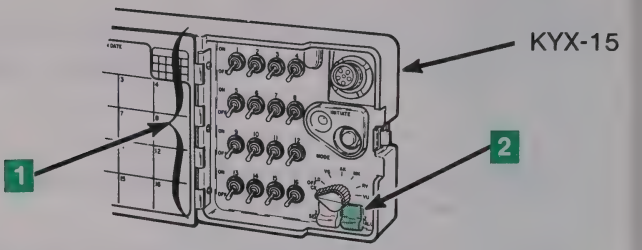
3. Press and release INITIATE switch **3**.
4. Set MODE switch **4** to OFF/CK.
5. Set all ADDRESS SELECT switches to OFF.
6. Set the ADDRESS SELECT switch for the first register you zeroized to ON.
7. Press and release INITIATE switch.
8. Watch INITIATE light **5**. If light flashes, repeat steps 1 through 8.
9. Repeat steps 6 through 8 for each register you zeroized.




## 2-25. ZEROIZING ALL KYX-15 REGISTERS

1. Set all KYX-15 ADDRESS SELECT switches **1** to OFF.

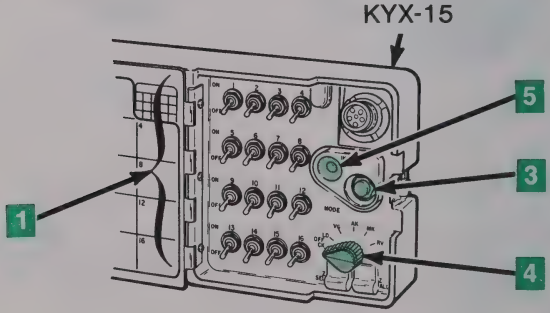
2. Press down on Z ALL protective plate **2**.



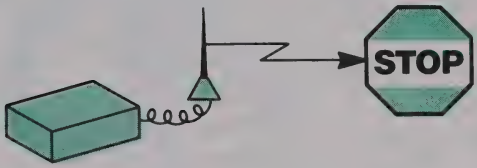

NOTE

**This places the KYX-15 in the zeroize mode.**

3. Press and release INITIATE switch **3**.

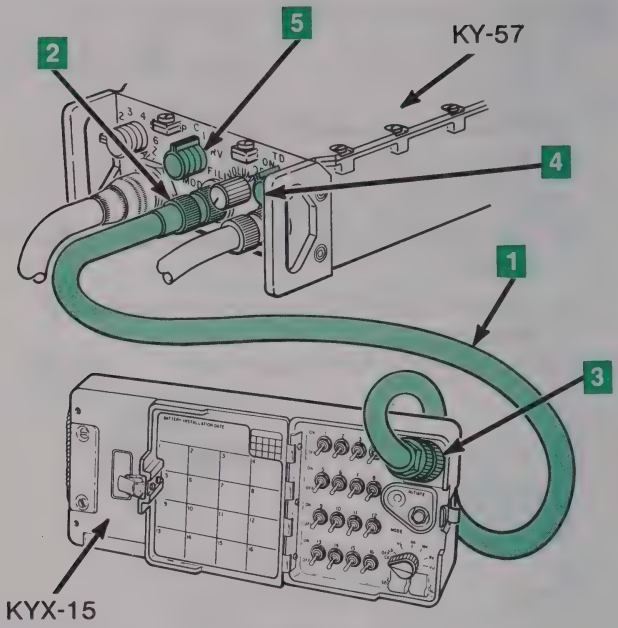


4. Set MODE switch **4** to OFF/CK.
5. Set ADDRESS SELECT switch **1** for register 1 to ON.
6. Press and release INITIATE switch.
7. Watch INITIATE light **5** . If light flashes, repeat steps 1 through 7.
8. Set ADDRESS SELECT switch for register 1 to OFF.
9. Repeat steps 5 through 8 for registers 2 through 16.

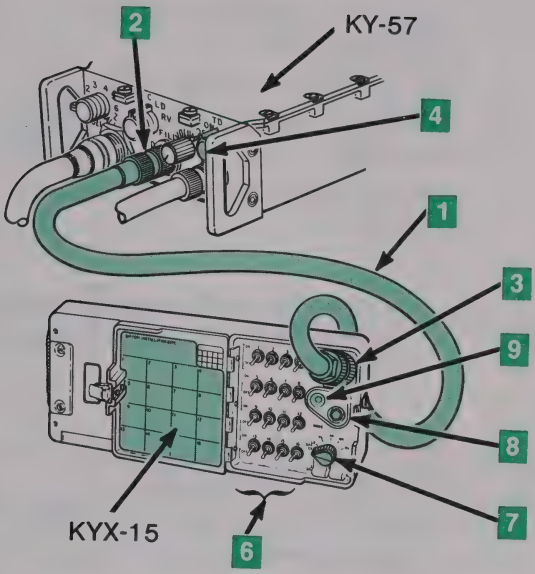



## 2-26. KEY GENERATE PROCEDURE

1. Using fill cable **1** , connect KY-57 FILL connector **2** to KYX-15 Input/Output connector **3** .




2. Set KY-57 POWER switch **4** to ON.
3. Set KY-57 MODE switch **5** to C.
4. Select KYX-15 register position (1 through 16) in which the cryptonet key (CNV) will be stored.




5. Set the ADDRESS SELECT switch 6 for the selected register to ON.

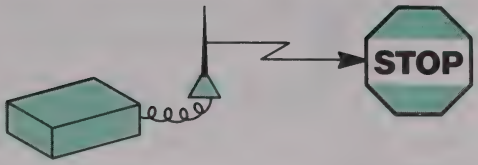
IMPORTANT **Make sure all other ADDRESS SELECT switches are set to OFF.**

6. Zeroize the selected register (see paragraph 2-24).
7. Set KYX-15 MODE switch **7** to VG.
8. Press and release KYX-15 INITIATE switch **8** .
9. Listen for several beeps, then noise in handset.

LOOK FOR THIS

**KYX-15 INITIATE light 9 should flash within approximately 3 seconds of beeps.**

10. Record Key designator on KYX-15 key record writing surface **10** .
11. Set ADDRESS SELECT switch **6** to OFF.
12. Repeat steps 4 through 11 for each new CNV.
13. Set KYX-15 MODE switch **7** to OFF/CK.
14. Set KY-57 POWER switch **4** to OFF.
15. After last CNV is generated and stored, disconnect fill cable from KY-57 and KYX-15.




## 2-27. AUTOMATIC REMOTE KEYING (AK) PROCEDURE

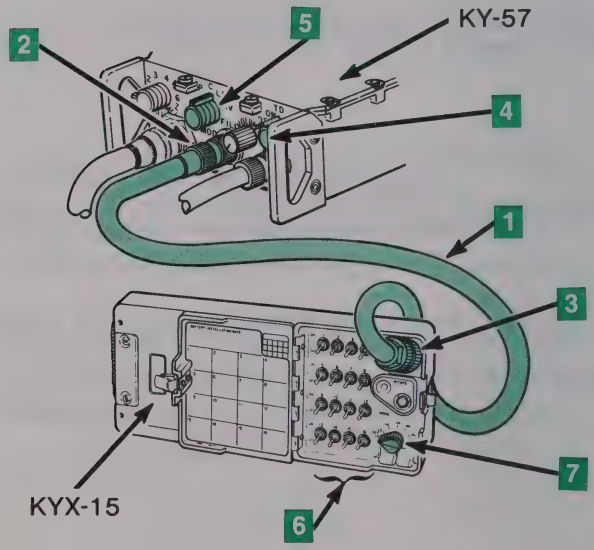
IMPORTANT

Before you can perform this procedure, all cryptonet subscribers must be able to communicate on the CNV that is being superseded (the "old CNV").

REMEMBER

Automatic remote keying (AK) simply allows an "old CNV" to be replaced by a "new CNV". In this procedure, you, the Net Controller, simply transmit the new CNV to the net.

1. Using fill cable 1, connect KY-57 FILL connector 2 to KYX-15 Input/Output connector 3.
2. Set KY-57 POWER switch 4 to ON.
3. Press and release handset PTT switch to clear alarms.
4. Set KY-57 MODE switch 5 to C.



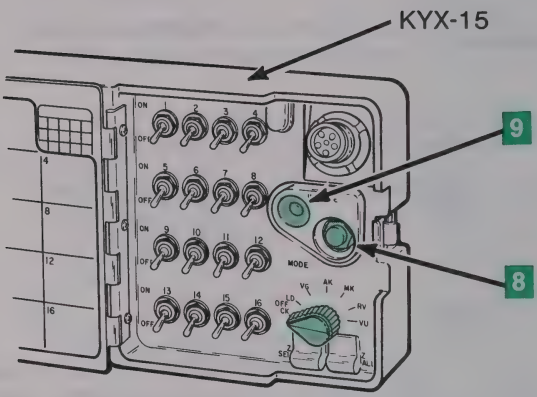
5. Set KYX-15 ADDRESS SELECT switch **6** for new CNV to ON.
6. Set ADDRESS SELECT switch(es) for subscriber RKV to ON.

REMEMBER ?!?! **All other ADDRESS SELECT switches must be set to OFF.**

7. Set KYX-15 MODE switch **7** to AK.
8. Contact the cryptonet subscriber(s).

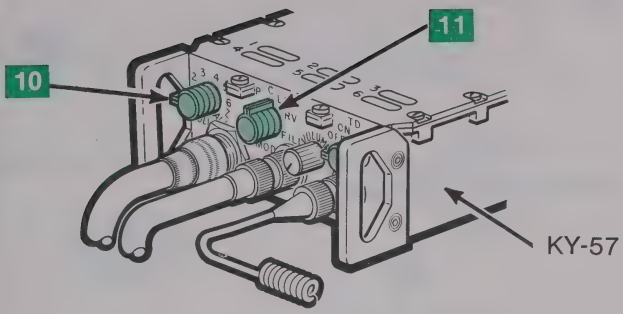
IMPORTANT **Use the CNV that you are superseding. If you can't communicate with this CNV, resolve the system problem, or establish communications using this CNV, then repeat steps 1 through 8.**

9. Tell subscriber(s) to stand by for AK operation.
10. Press and release KYX-15 INITIATE switch **8** .




LOOK FOR THIS

**After 3 to 5 seconds, several beeps should be heard in handset. When beeps stop, KYX-15 INITIATE light 9 should flash.**




11. Set KY-57 FILL switch **10** to 5.
12. Perform **Secure Communications Check** with subscriber(s).

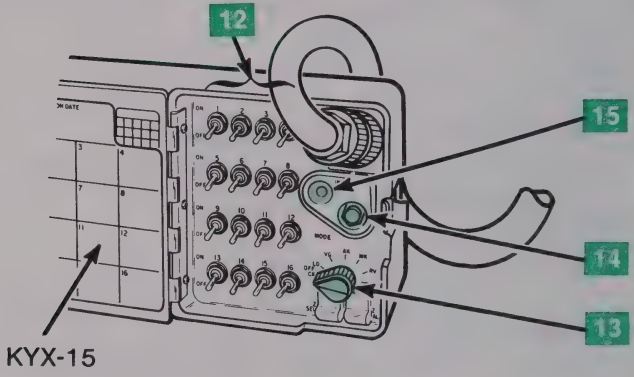
IMPORTANT

**If Secure Communications Check is not successful, repeat steps 2 through 12 of this procedure. If system still fails, call maintenance.**

13. Load new CNV into KY-57 (see paragraph 2-9).
14. Set KY-57 MODE switch **11** to C.

- To update Rekeying keys (RKV's):
  1. Set ADDRESS SELECT switches **12** for the RKV(s) you rekeyed in AK to ON.

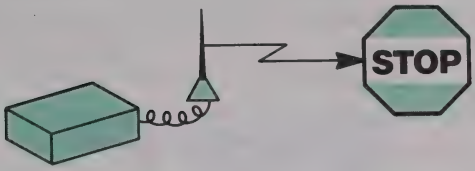
REMEMBER ?!?! **All other ADDRESS SELECT switches must be OFF.**




  2. Set MODE switch **13** to VU.
  3. Press and release INITIATE switch **14**.

LOOK FOR THIS **INITIATE light 15 will flash when operation is complete.**

4. Set all ADDRESS SELECT switches **12** to OFF.
5. Set MODE switch **13** to OFF/CHECK.




## 2-28. MANUAL REMOTE KEYING (MK) PROCEDURE

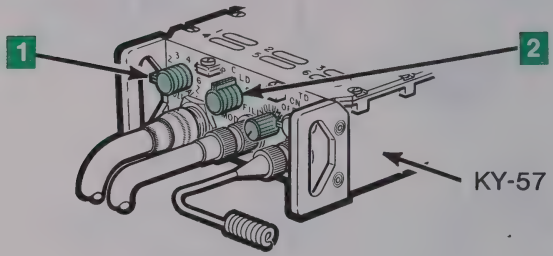
REMEMBER ?!

**Manual Remote Keying is used by the Net Controller to transmit a CNV to fill an empty Fill position, or to replace an "old" CNV in KY-57s on the net.**

1. The net controller will contact the subscriber by secure communications and tell the subscriber to :

   Stand by for MK.

IMPORTANT **Since this procedure requires verbal communications and coordination, make sure you use proper communications protocol/radio procedures during this procedure.**




2. The controller will then tell the subscriber to set the FILL switch **1** to 6. Controller then loads subscriber RKV into fill position 5.

3. Subscriber sets FILL switch and acknowledges by saying:

   **Roger, Over.**

4. Controller will tell subscriber to set KY-57 MODE switch **2** to RV.

5. Subscriber sets MODE switch and acknowledges by saying:

**Roger, Over.**

6. Controller will tell subscriber to set FILL switch **1** to position 1 through 6 for register selected to receive CNV.
7. Subscriber sets FILL switch to proper register and acknowledges by saying:

**Roger, Over.**

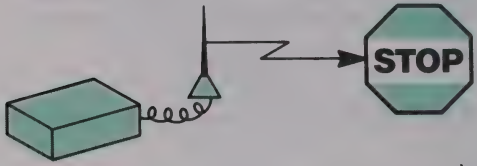
8. Controller instructs subscriber as follows:

**Stand by - you will hear a beep in your handset. After the beep, wait 2 seconds - then set the MODE switch to C.**

9. The subscriber listens for the beep, waits 2 seconds, then sets MODE switch **2** to C.
10. The controller will then call for a radio check using the new CNV.
11. If the radio check is successful, the controller will tell the subscriber to resume normal communications.

IMPORTANT

**If the radio check was not successful, the net controller must contact the subscriber in plaintext, and instruct the subscriber to set the KY-57 FILL switch to 6, then stand by. Controller will then repeat this procedure starting with step 3.**



# CHAPTER 3
# OPERATOR MAINTENANCE

## SECTION I OPERATOR MAINTENANCE

### 3-1. SCOPE OF OPERATOR MAINTENANCE

Operator maintenance of the KY-57 and its associated items (HYX-57 and Z-AIJ battery case) consists of three primary areas.

1. In-service checks. This consists of monitoring the KY-57, HYX-57 during operation to make sure that it is working properly.
2. Preventive maintenance. This consists of scheduled maintenance actions performed by the operator.
3. Battery replacement. Removal and replacement of the main battery (BA-5590/U) and fill battery (BA-1372/U).

### 3-2. IN-SERVICE CHECKS

In-service checks consist of monitoring your equipment during normal operation to ensure that all parts of the system are working properly. Chapter 4 of TM 11-5810-256-12 provides a detailed description of how to perform in-service tests.

## 3-3. PREVENTIVE MAINTENANCE CHECKS AND SERVICES

Preventive Maintenance Checks and Services (PMCS) for the KY-57 are described in chapter 4 of TM 11-5810-256-12.

## 3-4. BATTERY REMOVAL/REPLACEMENT

Procedures for removal and replacement of equipment batteries are provided in the following paragraphs.


| | PARAGRAPH NUMBER | PAGE NUMBER |
|---|---|---|
| **KY-57/HYX-57 Main Battery** | **3-5** | **3-3** |
| **KY-57 Fill Battery** | **3-6** | **3-7** |
| **KYX-15 Fill Battery** | **3-7** | **3-11** |
| **KYK-13 Fill Battery** | **3-8** | **3-14** |
| **KOI-18 Fill Battery** | **3-9** | **3-17** |

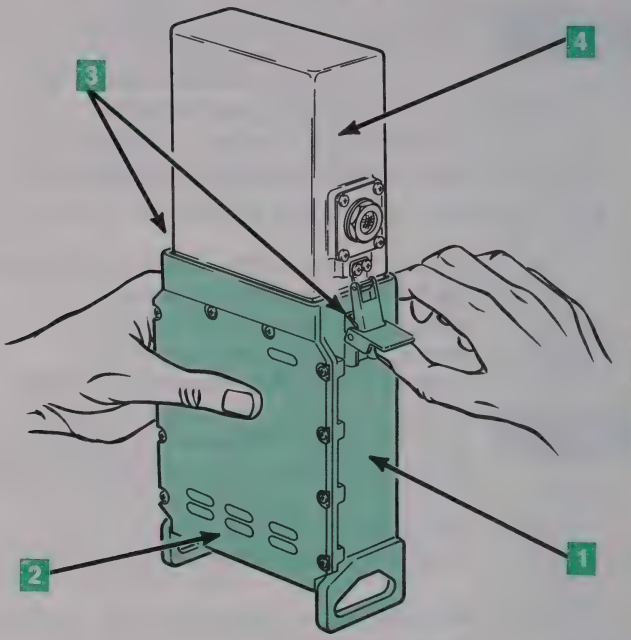
Batteries used in the KY-57 can explode if they are mishandled or abused. Battery explosions can cause death or severe injury, equipment damage, and environmental contamination. Be sure you understand how to correctly handle, and dispose of, both mercury and lithium batteries.

## 3-5. KY-57/HYX-57 MAIN BATTERY

The KY-57 and HYX-57 use the Lithium BA-5590/U as a main battery. Care must be used in the handling, operation, and disposal of this battery to prevent physical damage or overheating. Mishandling can result in battery explosion causing personnel death or injury, equipment destruction, or environmental contamination (see page A for detailed Lithium Battery warnings).

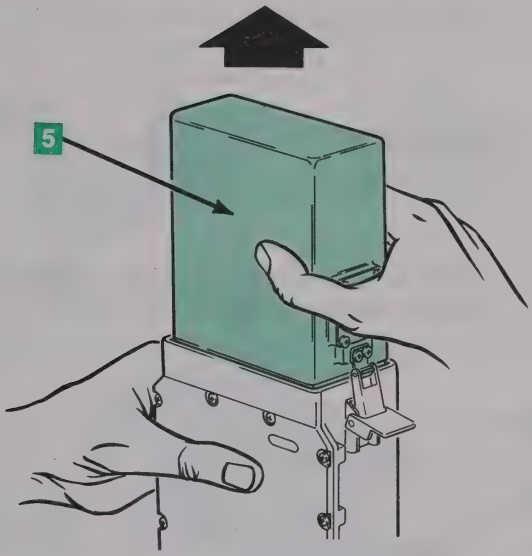
Procedure for removing and replacing KY-57 and HYX-57 main batteries are identical. The term Unit is used in this procedure to identify either the KY-57 or the HYX-57.

1. Place the unit **1** on a clean surface with the front panel **2** facing down.



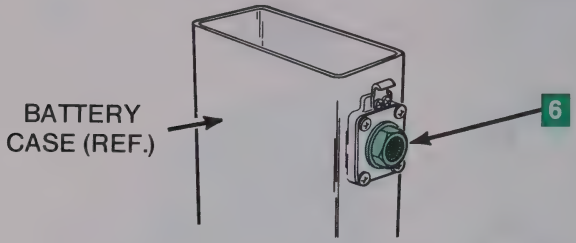

2. Release two spring latches **3** securing battery case **4** to unit.

3. Slide battery case up and away from unit to expose main battery **5** .

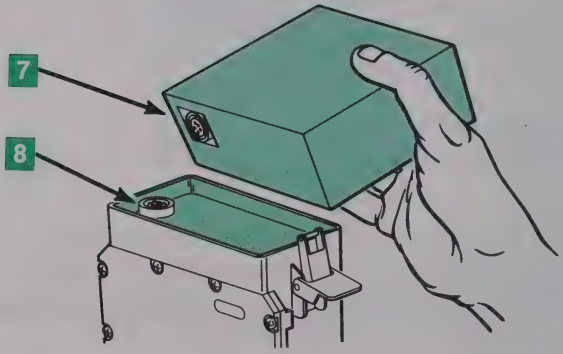



4. Disconnect battery from unit by lifting battery straight up and away from unit.
5. Dispose of battery in the manner prescribed in your unit SOP.

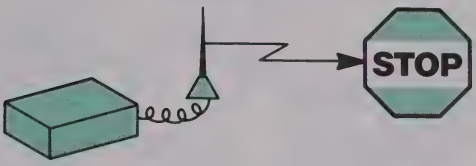
6. Visually inspect battery case pressure relief valve **6** for damage, clogging. Clean valve if clogged; replace battery case if valve is damaged.




7. Align 6-pin connector on battery **7** with battery connector **8** on rear of unit.



8. Slide battery toward unit until connectors fully mate and are secure.
9. Slide battery case downward over battery until fully seated.
10. Engage and lock two spring latches.

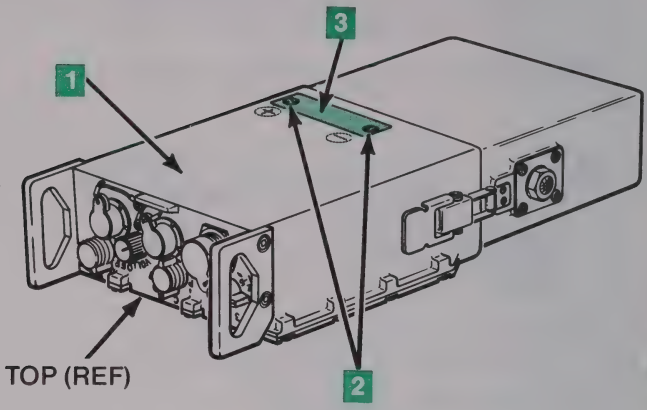



## 3-6. KY-57 FILL BATTERY

WARNING

**The KY-57 fill battery (BA-1372/U) is a mercury battery. Care must be used in the handling and disposal of this battery. Mishandling of the battery can result in environmental contamination; and in long-term health hazards which can result in personnel death (see page B for detailed mercury battery warnings).**

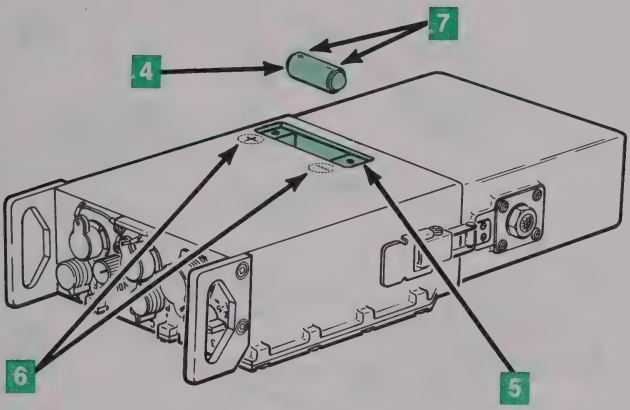
1. Place KY-57 **1** top down on a clean surface.




2. Using a flat-tip screwdiver, loosen two retaining screws **2** securing fill battery cover **3** .

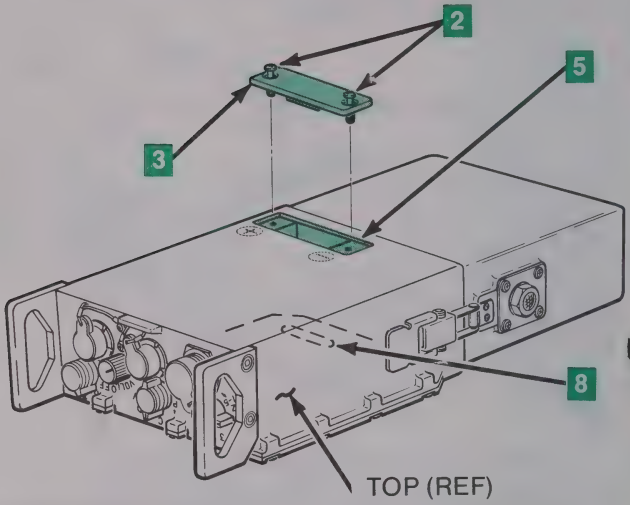
REMEMBER ?!?! **A coin (dime or quarter) can be used to loosen screws if you don't have a screwdriver.**

3. Remove fill battery cover.
4. Remove battery 4 from battery compartment 5 .




5. Dispose of battery in the manner prescribed in your unit SOP.
6. Visually inspect battery compartment for corrosion or other damage.
7. Install new BA-1372 fill battery in battery compartment, being sure that polarity indicators on KY-57 6 and fill battery 7 are matched (+ to +, and − to −).

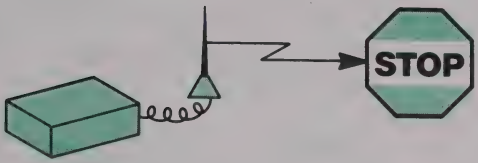
8. Position battery cover **3** on battery compartment **5**.




9. Tighten two retaining screws **2**.

CAUTION **Do not overtighten screws.**

10. Turn KY-57 top up. Record battery installation date on BAT INSTL writing surface 8 .

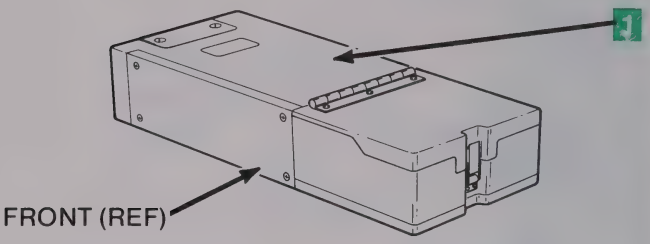



## 3-7. KYX-15 FILL BATTERY

WARNING

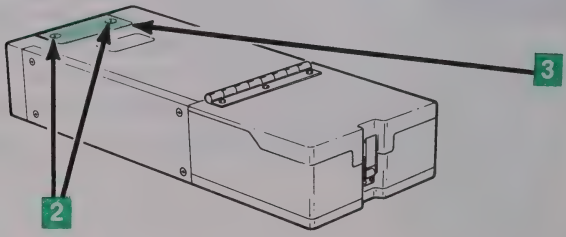
**The fill battery (BA-1372/U) used in this device is a mercury battery. Care must be used in the handling and disposal of this battery. Mishandling of the battery can result in environmental contamination; and in long-term health hazards which can result in personnel death (see page B for detailed mercury battery warnings).**

1. Place KYX-15 **1** front down on a clean surface.

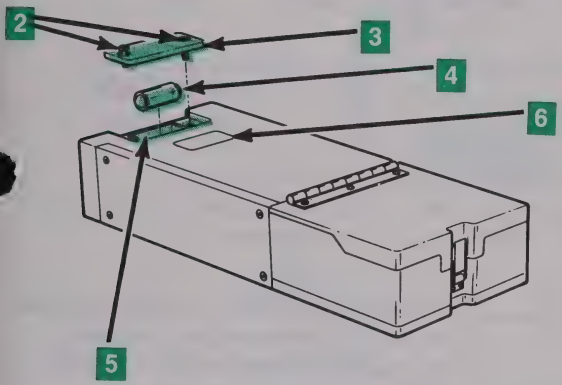



2. Using a flat-tip screwdriver, loosen two retaining screws **2** securing battery cover **3** .

REMEMBER ?!?! **A coin (dime or quarter) can be used to loosen screws if you don't have a screwdriver.**



3. Remove battery cover.
4. Remove battery 4 from battery compartment 5 .
5. Dispose of battery in the manner prescribed in your unit SOP.
6. Visually inspect battery compartment for corrosion or other damage.

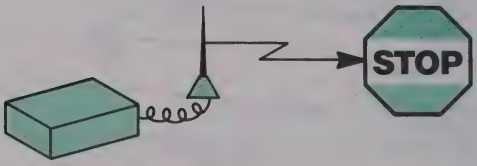



7. Install new BA-1372 fill battery in battery compartment, being sure polarity indicators on battery and in battery compartment are matched (+ to +, and − to −).

8. Position battery cover **3** on battery compartment **5**.
9. Tighten two retaining screws **2**.

CAUTION **Do not overtighten screws.**

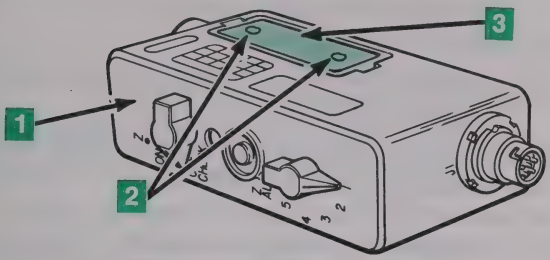
10. Record battery installation date on writing surface **6**.




## 3-8. KYK-13 FILL BATTERY

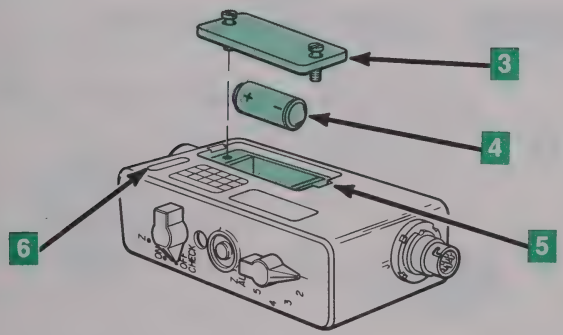
WARNING **The fill battery (BA-1372/U) used in this device is a mercury battery. Care must be used in the handling and disposal of this battery. Mishandling of the battery can result in environmental contamination; and in long-term health hazards which can result in personnel death (see page B for detailed mercury battery warnings).**

1. Place KYK-13 **1** on a clean surface as shown.




2. Using a flat-tip screwdriver, loosen two retaining screws **2** securing battery cover **3** .

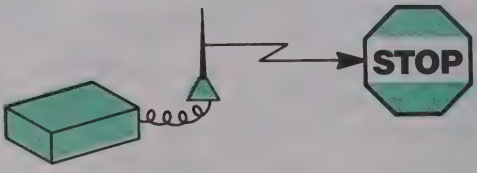
REMEMBER ??! **A coin (dime or quarter) can be used to loosen screws if you don't have a screwdriver.**



3. Remove battery cover.
4. Remove battery **4** from battery compartment **5** .
5. Dispose of battery in the manner prescribed in your unit SOP.
6. Visually inspect battery compartment for corrosion or other damage.
7. Install new BA-1372 fill battery in battery compartment, being sure polarity indicators on battery and in battery compartment are matched (+ to +, and − to −).
8. Position battery cover **3** on battery compartment **5** .
9. Tighten two retaining screws **2** .

CAUTION **Do not overtighten screws.**

10. Record battery installation date on writing surface **6** .

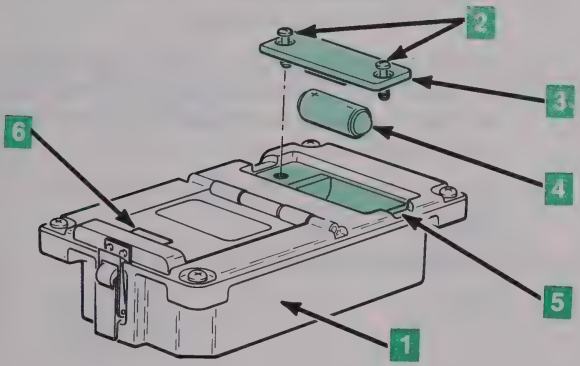


## 3-9. KOI-18 FILL BATTERY

**WARNING**

**The fill battery (BA-1372/U) used in this device is a mercury battery. Care must be used in the handling and disposal of this battery. Mishandling of the battery can result in environmental contamination; and in long-term health hazards which can result in personnel death (see page B for detailed mercury battery warnings).**

1. Place KOI-18 **1** on a clean surface as shown.

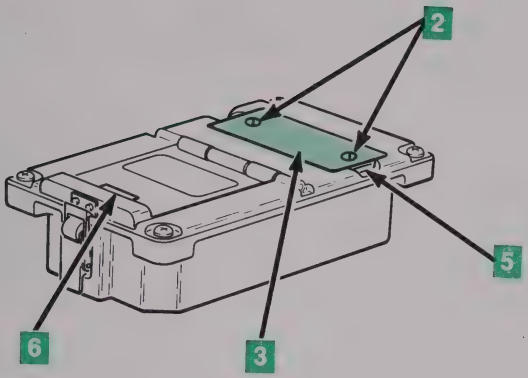


2. Using a flat-tip screwdriver, loosen two retaining screws **2** securing battery cover **3**.

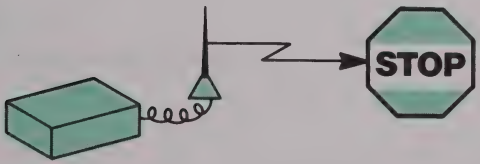
REMEMBER ??! **A coin (dime or quarter) can be used to loosen screws if you don't have a screwdriver.**

3. Remove battery cover.
4. Remove battery **4** from battery compartment **5**.
5. Dispose of battery in the manner prescribed in your unit SOP.
6. Visually inspect battery compartment for corrosion or other damage.
7. Install new BA-1372 fill battery in battery compartment, being sure polarity indicators on battery and in battery compartment are matched (+ to +, and − to −).
8. Position battery cover **3** on battery compartment **8**.
9. Tighten two retaining screws **2**.

CAUTION **Do not overtighten screws.**




10. Record battery installation date on writing surface **6** .



# INDEX


A PAGE

Automatic Remote Keying ..... 2-79

C

CONTROLS AND INDICATORS
KY-57 ..... 2-2
HYX-57 ..... 2-4
KYX-15/15A ..... 2-7
KYK-13 ..... 2-8
KOI-18 ..... 2-9

E

EQUIPMENT DESCRIPTION
BA-5590 ..... 1-3
KY-57 ..... 1-2
HYX-57 ..... 1-4

H

HYX-57
Controls and Indicators ..... 2-4
Main Battery ..... 3-3

PAGE

I

INDICATORS
HYX-57 ..... 2-4
KOI-18 ..... 2-9
KY-57 ..... 2-2
KYK-13 ..... 2-8
KYX-15/15A ..... 2-7

K

KOI-18
Controls and Indicators ..... 2-9
Fill Battery ..... 3-17

KY-57
Controls and Indicators ..... 2-2
Fill Battery ..... 3-7
Loading from the KYX-15 ..... 2-24
Loading from the KOI-18 ..... 2-16
Loading from the KYK-13 ..... 2-20
Main Battery ..... 3-3
Zeroizing ..... 2-66

PAGE

KYK-13
Controls and Indicators ..... 2-8
Fill Battery..... 3-14
Loading from the KOI-18..... 2-32
Loading from the KYX-15 ..... 2-39
Loading from the KYK-13 ..... 2-44
Zeroizing..... 2-70

KYX-15
Controls and Indicators ..... 2-7
Fill Battery..... 3-11
Loading from the KOI-18..... 2-28
Loading from the KYK-13 ..... 2-32
Zeroizing..... 2-72

L

LOADING
KY-57 from the KOI-18..... 2-16
KY-57 from the KYK-13 ..... 2-20
KY-57 from the KYX-15 ..... 2-24
KYK-13 from the KOI-18 ..... 2-32
KYK-13 from the KYX-15..... 2-39
KYK-13 from the KYK-13..... 2-44
KYX-15 from the KOI-18 ..... 2-28
KYX-15 from the KYK-13..... 2-32

PAGE

M

Manual Remote Keying ..... 2-28

O

Operator Maintenance ..... 3-1
Operating the KY-57 ..... 2-56
Operating with a Repeater ..... 2-61
Operating without a Repeater ..... 2-56

Z

ZEROIZING
KY-57 ..... 2-66
KYK-13 ..... 2-70
KYX-15 ..... 2-72

## GLOSSARY

**CCI** - Controlled Cryptographical Item - communications security equipment which is issued and maintained through the Army Standard Supply System.

**CECOM** - Communications-Electronics Command - the U.S. Army command responsible for logistics support of radio - communications equipment except communications security equipment.

**COMSEC** - Communications Security - equipment/ procedures employed to prevent interception and use of U.S. military communications information/ signals by opposing forces.

**COMSEC equipment** - equipment used to provide communications security, and issued and maintained through special COMSEC logistics channels.

**CNV** - Crypto Net Key - the common key used by all members of a cryptonet to establish the net.

**Common Fill Device** - a device which is designed to fill more than one type of COMSEC/CCI equipment.

**Common User Circuit** - a communications circuit which may be accessed by any user using a telephone, switchboard or similar device.

**Cryptonet** - a secure, multisubscriber, communications system.

**CSLA** - Communications Security Logistics Activity - the U.S. Army activity responsible for logistics support of all Army COMSEC/CCI equipment.

**Dedicated circuit** - a communications circuit specifically designed for the use of particular users, and not accessible to system common users.

**Decrypt** - a process (electronic or mechanical) used to restore encrypted information to its original useable (plaintext) form.

**Encrypt** - a process (electronic or mehanical) used to mask communications information in such a way that it is unuseable by opposing forces.

**ESD** - Electrostatic Sensitive Devices - electronic devices which may be damaged, degraded, or destroyed by the discharge of static electricity. Most modern transistor and electronic circuit chips are electrostatic sensitive devices

**Fill** - to load a key into COMSEC device.

**Fill device** - an electronic, electro-mechanical, or mechanical device used to fill COMSEC equipment.

**KAG** - NSA prepared document describing doctrine for use of COMSEC equipment.

**KAM** - NSA prepared equipment maintenance manual.

**KAO** - NSA prepared equipment operator's manual.

**KEY** - a pattern (electronic, mechanical, etc.) used to alter or mask communications information in such a manner as to render it unuseable to anyone not possessing that key.

**Logistics** - the documentation, spare parts, training, maintenance facilities, etc., required to support and maintain fielded equipment.

**NSA -** National Security Agency - the Government agency responsible for the development and overall support of COMSEC equipment.

**Primary Key -** the Key Encryption Key (KEK) used to establish the cryptonet (same as CNV).

**RKV -** Rekeying Key - a secondary key generated by the Net Controller and used to alter net membership.

**Secondary Keys -** all keys used in the systems other than the CNV.

**TEK -** Traffic Encryption Key - the secondary key which is used when actual secure communications information (traffic) is transmitted between net members.

**Variable -** same as key (an obsolete term which is no longer being used in COMSEC documentation).

BY ORDER OF THE SECRETARY OF THE ARMY:

CARL E. VUONO
*General, United States Army*
*Chief of Staff*

OFFICIAL:

R. L. DILWORTH
*Brigadier General, United States Army*
*The Adjutant General*

---

DISTRIBUTION:
To be distributed in accordance with DA Form 12-43, Operator maintenance requirement for TSEC/KY-57

☆U.S.G.P.O. 1988 218-646/90060

FOR OFFICIAL USE ONLY

PIN : 064209-000

**FOR OFFICIAL USE ONLY**